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THE UNIVERSITY OF ALBERTA

AN EXPLORATORY STUDY OF THE PROCESSES USED FOR READING WRITTEN LANGUAGE AND MUSIC

BY

PATRICIA NAOMI KATHLEEN BRINE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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THE UNIVERSITY OF ALBERTA

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled An Exploratory Study of the Processes Used for Reading Written Language and Music submitted by Patricia Naomi Kathleen Brine in partial fulfilment of the requirements for the degree of Master of Education in Elementary Education.

Grace Malicky
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Date: October 22, 1989

ABSTRACT

The processes involved in text reading have been the focus of extensive research. The purpose of this study was to explore how students read both text and music and to search for parallels and differences. It was accomplished by first adopting an interactive processes model of text reading, a set of established text reading tests and a system of coding and analysing miscue and recall data for text reading processes. Then a set of music reading passages and a coding and analysis system for these passages was set up based on text reading tests and coding. Parents and school music and language teachers were interviewed and school records were examined to explore the background of each student. Eight students were tested and audiotaped. The test results were coded, categorized, analysed and interpreted to discover the processes the students used as they read.

Generally students in the study had different profiles for music and text reading. Only two had similar profiles suggesting that they engaged similar processes when reading music and text Similarities were more evident on the miscue than recall data showing similar processes often being used for music and text reading. The miscue task may be more appropriate for examining music reading processes.

A combination of data from miscue and recall analysis showed that students in this study relied more on visual cues than on background knowledge to read music than to read text. They attended to, analysed and associated visual cues to sound more than they used their background knowledge to synthesize, infer, predict or monitor while reading music. Most of the students were able to make adequate use of their knowledge to predict as they read text. Two students who had a long background of reading music equal to their experience reading text and a student with especially high intelligence made the same adequate use of knowledge in music as in text. The Interactive Processes Model of reading used could be a possible basis for developing a model of reading for reading music.

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Chapter 1

INTRODUCTION TO THE STUDY

All music teachers must eventually teach their students to read music if they are to introduce them to the musical world beyond the dependent and limited playing or singing "by ear". We seek to open up the world of music literature and understanding of music to students by giving them independence through being able to read and interpret for themselves what composers have written for many centuries. For the same reason that we teach children to read the written language instead of remaining for their lifetimes dependent on the spoken word, we seek to enlarge the musical world available to individuals through teaching them to understand and interpret the symbols by which humans pass on their musical ideas to others.

There are many definitions of reading, most of which convey the idea that reading involves bringing meaning to symbols. The following are representative of the definitions that exist:

> "....reading may be considered as consisting of the interaction between author-text-reader.... (Fagan, 1984, p. 1-28) [It] is interactive in the sense that linguistic input triggers-off prior knowledge and prior knowledge allows a reader to bring an interpretation to the text, filling in gaps if necessary. (Ibid, 1-23)
>
> Reading is a response to and comprehension of visual symbols (Mursell, 1958, p. 147)

There are different means by which we acquire and help others to acquire the ability to gain meaning from symbols. What we perceive as being the important components of reading differs, but whatever means are used, or whatever components considered important, the seeking of meaning is the ultimate goal. In both music and language the meaning of the whole is much more than the meaning of each of the parts. Individual notes and words do not convey as much meaning in isolation as they do in context. A string player must not only see the note and relate it to a sound, a pitch of a fixed duration or rhythmic value, he/she must also relate it to bow placement, speed of bow, direction of bow and bow pressure with his/her right hand. As well, placement of the correct finger of the left hand in the best position for the group of notes being read, along with additional considerations for tone such as vibrato and choice of string on which to place the notes, are important details.

Such complications as are found in the reading of music by string players are also part of the difficulties encountered by persons reading written language. Many students in special remedial classes are capable of reading individual words, having mastered their phonics, but they have not yet related these individual words or sounds to meaning; that is, they have not yet grasped the notion that words and groups of words that are seen on the printed page have meaning. In just such a way is a string player meant to see the difference between sounding a pitch on the instrument and producing music through the instrument. A string player must not only relate the symbols on the staff to a fixed pitch, but he must, through interpreting the notes in the context of the phrases and other signs on the page, interpret it so that it makes musical sense.

> A musical score is not a wilderness of notes, any more than a page of print is a wilderness of letters. The letters come together in constellations or groupings, which convey meanings. To look unintelligently at a page of print is to see letters. To look at it intelligently is to see meaningful groupings. So, too, with music......but in this case the meanings are musical effects. (Mursell, 1956, p.182)

This exploratory study will not look merely at symbol decoding, but will look at how students get meaning from the total of a piece of music or text , what factors are related to this meaning acquisition and if the processes used in getting meaning in text and music are related.

Need for the Study

Much time and money have gone into the study of what processes are used in reading written language and many opinions have been expressed regarding the best way to teach children to read text. As I explored the research being done about text reading, I looked for similar research into what processes are used to read music and, finding none, began to wonder if the research on text reading could be used to learn more about music reading. I wondered if there are parallels in how children read text and how they read music.

As a string teacher, I have tried a variety of approaches to the teaching of music reading with some, but not consistent, success. I was never sure why some students learned to read music well and others didn't. Any answers I received to questions I asked about music reading for string players were always tied to the technical aspects of learning to play the instrument. Although, as described in Chapter 2, I was already aware of and came upon more descriptions of approaches to the teaching of the technique of playing the stringed instruments and of approaches to the teaching of text reading, I did not find any previous studies which concentrated on defining the processes used in reading music or on examining the relationships between processes used in text reading and music reading. It seemed that it could be very useful to a music teacher , who must necessarily teach music reading along with playing technique, to become aware of what processes are used in the reading of music. An awareness of these processes could lead to a greater understanding of the reading task and how it can be approached. This could lead to greater success in helping children to achieve the skill.

Purpose of the Study

The purpose of this study was to examine how children read both text and music, to make comparisons, and to look for parallels. This purpose was accomplished by first adopting a text reading model, an established set of tests, and a system of coding and analysing of data in terms of text reading processes, and then devising a music test with coding and analyses based on those used for reading. An important aspect of this study involved examination of the results of these observations to see if there appeared to be any similarities or differences in the childrens' approach and/or their success in reading the text and music. Being aware that learning is part of the total of a person's experience, it was considered important as well to obtain data on the childrens' experience in their total literature and music environment and relate these to the processing observed in the text and music exercises.

Limitations of the Study

1. Inferences were made from overt activity about covert activity.
2. The exploratory nature of the study and the size of the sample did not allow for generalization.
3. The exploratory nature of the study, did not allow for definite conclusions or answers; however, indicators appeared and questions were generated.
4. The music exercises were newly devised. The exercises can be considered only as a base on which to begin developing more sophisticated and reliable indicators.

Significance of the Study

Music reading is an important skill to be acquired so that childrens' music experience is not limited to that which they can hear and copy. The way children acquire this skill needs to be examined carefully and thoroughly to help instrumental music teachers understand what the children are doing as they attempt to learn to read the music. This detailed study of children through interviews and testing is intended to be a beginning for a focus on the processes children use when they read music. It is based on text reading research in an attempt to take advantage of the research already completed in this field and determine if it can be related to music.

Regardless of whether or not there are similarities between text and music readers, this will help music teachers become aware of what processes are used by students learning to read music. If similarities are discovered, the reading research could be applied directly to the teaching of music reading. This could influence the way materials are presented, i.e. the stages, the order and format of materials presented. If major differences present themselves, this knowledge could be used to show what different approaches are necessary for the teaching of music reading.

Teachers of musical instruments need to have direction in the teaching of reading of music for the instruments. It is hoped that the ultimate result will be an improvement in the understanding of reading processes used in music and, based on this understanding, an improvement of the skills of music teachers in developing effective approaches to the teaching of music reading.

Chapter 2

BACKGROUND OF THE STUDY

Introduction

This chapter includes a description of a reading processes orientation to reading, a description of some of the contemporary approaches to the teaching of music reading to string students, and a discussion of possible similarities between print and music reading that serve as a basis to the study. The chapter includes a description of Fagan's Interactive Processes Model and the approach used in interpreting and analysing reading behaviors by Fagan and Malicky at the University of Alberta.

Reading Processes Orientation to Reading

Reading research is about one hundred years old, and an emphasis on building models of reading has been occurring since about the mid 1950s. Although a systematic study of the reading processes has been a relatively recent development, processes were being written about early in the 1900s by Huey (1908) and Thorndike (1917). The work of Goodman and his colleagues from the 1960s, which culminated in a formal description of a reading model in 1970, was based on information processing perspective. Goodman emphasized the psycholinguistic aspects of reading resulting in a holistic view of the reading process. Smith (1971) also described the linguistic and cognitive processes from a psycholinguistic perspective. Ruddell & Singer (1970) noted that efficient reading depends on skill in selecting appropriate cues from the printed page rather than phonic details. There have been theories which emphasized a linear approach to reading (one skill being built upon another without interaction) such as the Gough model of 1972. Rumelhart (1977) pointed out the deficiencies in the linear approach and focussed attention on an interactive model which emphasized readers' dependence on contextual circumstances and use of multiple information sources. Rumelhart focussed on the interaction between text and the reader's perception of that text based on the context in which they meet and the flexibility of processing as the context changes.

Reading which relies on graphic input and on processing of input in a linear and sequential fashion is termed "bottom up" (Adams, 1980) or "data-driven" (Rumelhart, 1980; Anderson, 1978) processing. The emphasis in this type of reading is principally on visual information. Reading which relies more on non-visual information (background or stored knowledge) and predicting (drawing on that knowledge) is termed "top-down" (Adams, 1980) or "conceptually-driven" (Rumelhart, 1980; Anderson, 1978) processing. Adams (1980) believes that a combination of these two orientations occurs at all levels of analysis simultaneously in the skilled reader whereas a poor reader may be using one strategy only or to the extreme. Interactive is the term applied to a balanced use of both approaches to reading, i.e. the dependence on background knowledge to bringing meaning to the symbols on the page.

Interactive Processes Orientation.

The interactive processes orientation proposed and explained by Fagan (1987) refers to the interaction between the reader, what he already knows (world knowledge - schema) and what he is reading (the text). World knowledge is stored in a reader's memory as a result of his life experiences.

> Readers....usually have a wealth of resources at their disposal. They possess considerable knowledge about the world, language, tasks, and strategies (Fagan, 1987, p. 29).

Fagan notes that the text itself does not contain meaning and, though the code may evoke meaning, it is only realized when readers interact effectively with the text. Frank Smith states,

> From a reading point of view: information brought to reading by the brain is more important than information provided by the print....from an instructional point of view: children learn to read by reading (Smith, 1978, p. v).

Anderson (1978) agrees that what readers know is more important than what they see and states that meaning is in the mind of writers as they write and in the mind of readers as they reconstruct meaning as they read.

Sinatra and Stahl-Gamke in their book on the use of the right brain state:

> .....children learn by doing, by interacting with their environment, and by constructing mental schema of how the physical world operates (Sinatra & Stahl-Gamke, 1983, p.65)

Fagan further notes from his interactive processes orientation that fluent readers are actively thinking and inferring or predicting as they try to reconstruct the author's meaning. However, text can have meaning for a reader only when that reader possesses the appropriate knowledge. If readers have no concepts, background knowledge or schema that is appropriate to the text, they cannot provide a framework to store in their minds the data from the text. If there is no common meaning between the reader and the text, no understanding can occur. If there is a schema, the text can be integrated into the reader's background knowledge, altering his "schema" or conception of his physical surroundings or happenings by what information he takes from the text. In this way background knowledge is constantly in flux, with schemata being altered continuously as readers interact with text and other stimuli in the world. In order to acquire knowledge, one must have a knowledge base into which each part of the new knowledge can be fitted. Fagan also points out that how we feel about the situation (reading, music, any part of our world) affects how we learn from it.

A reader's background knowledge is in long term memory. Frank Smith writes that in fluent reading, the eye is always ahead of the brain's decisions. However, there is a limit to how much visual information the brain can handle in making sense of print: "The less nonvisual information the reader can employ, the harder it is to read"(Smith, 1978, p.6). The nonvisual information is the background knowledge in a reader's long term store. The more background knowledge readers can use from their long term store the less they must depend on the visual information. They can make use of this knowledge to predict (eliminate unlikely alternatives) and thereby relieve the visual system, short term memory, of overload in reading. Fagan believes that the kind of processing that takes place between the reader's resources in his working memory and the text influences how the information is stored and retrieved.

Processes Used in Reading

Processes used in reading do not operate independently. The following are explanations of the kinds of processes used concurrently and to different extents by different readers (Fagan, 1987):

1. Attending describes a reader's awareness of and attention to the text. It differs in duration and intensity and this is associated with the automaticity with which reading takes place, i.e. if a reader does not have to concentrate on decoding words, he can shift his attention to other processes of reading.
2. Analysing is the process engaged in by readers as they take apart the text and seeks to make meaning from the letters, their sequence in the construction of words, the groups of words, and the structure of the writing (story, essay, advertisement, etc.).
3. Associating is the process of establishing relationships. It is the process readers are using when they see a symbol and relate it to a sound or to a meaning. The readers are bringing to the text their knowledge that things go together, that when they see or hear one, the other may be retrieved from their long-term memory because they are related. Associating meaning to the text depends on the person's prior knowledge which is built by the reader's real life experiences.

4. Predicting is a very important process during which the reader is thinking ahead, having expectations, making guesses or hypotheses, and is greatly dependent on the reader's background knowledge. The more graphic, syntactic and semantic knowledge that readers have, the better can be their predicting.

5. Inferring is a process similar to associating and predicting but instead of adding information from long term memory to the sequence in the text, the reader adds details of information to the text, filling out the text.

6. Synthesizing is the process of bringing the pieces of information into a whole, or being aware of the whole, integrating the separate pieces of information into a single meaningful unit. It may involve bringing the letters of a word together to make a meaningful word, bringing individual words together to make a meaningful phrase or sentence, or bringing different pieces of information together from different sentences and understanding them together as related.

7. Generalizing is the process readers use as they identify the main point of what they are reading, the moral or principle, and adjust their schema and label it in their background knowledge. They select that which is important and relate details and delete that which is not.

8. Monitoring is the process readers use to check to see that what they are expecting (predicting) is what is actually in the text and makes sense (is meaningful). It is a process used to check to see that what is read suits the purpose (leisure, getting information,clarifying a concept). On the basis of monitoring, readers decide through the feedback they are getting whether or not to continue as they have been with predictions, associations, inferences, etc.

All these processes just described are not independent. As Fagan writes,

> The processes can not be seen in isolation from one another, although focus may be placed on one or more of these processes at any one point in time (Fagan, 1987, p.85).

The meaning that readers take from text must be consistent with the author's intent (did the author intend to inform? persuade? entertain? instruct?) as well as what the readers wish from the text. The readers' intent will determine how they process what they read and what meaning they take from the text, whether it is what they wanted to get from it or what the author intended they get from it. Fagan believes that "Reading should always be functional" (Fagan, 1987, p. 77). How a reader reads is determined by purpose. The readers as looked at from Fagan's interactive processes orientation are doers and what they do in interacting with the the text, the processes they use to interact, are important in seeking out why they are or are not successful. Fagan believes that if readers are not successful in discovering the meaning of the author from the text, there may be many reasons. They may not share a similar schema, the readers may not have sufficient language resources, the style of the author may not be familiar to the readers, the readers may not be processing appropriately (predicting or monitoring), or they may not have enough knowledge of basic grapheme-phoneme relationships.

We expect meaning in our daily life experiences. We should expect meaning from our reading. "Non-meaning is non-reading" (Fagan, 1987, p. 81).

Analysis of Reading to Discover Processes Used

Two techniques which Fagan and Malicky suggest can be used to discover reading processes are miscue analysis and analysis of uncoded recalls of passages read. They believe that miscue analysis provides an indication of what readers are doing, how they process at the time of the reading and storing of information. Analysis of the readers' unaided recalls of what they have read helps us get insight into how the readers deal with data they have already stored in their minds.

Miscue Analysis

"Miscue" is the term applied to reading errors observed as children read orally, or an "unexpected response" (Fagan, 1984). Goodman and Burke (1972, p. 15) refer to miscues as "windows to the reading process" which indicate to us if and how the readers are predicting and confirming as they read. Fagan suggests a simple approach to interpreting miscues. He suggests that we ask the following (Fagan, ibid, p. 87):

1. If there is a substitution, is it similar in graphic form to the text word (attending, analyzing graphemes)? If it is, but not meaningful, the reader may consider reading to be sound-symbol associating instead of a meaningful activity.
2. Are the miscues meaningful in terms of what is read (do readers expect meaning, are they trying to access appropriate schema and fit what they read in with their world knowledge or are they synthesizing but not adjusting the

schema, not following through)?

3. Are the miscues meaningful in part such as with prior text but not text following the miscue (predicting but not adjusting on the basis of what is in the text)?

3. Are the miscues related to and consistent with the meaning of text words (synthesizing)? Is the accessed schema related to that of the author, or do the substitutions, additions and omissions indicate that predicting is the dominant process being used.

4. Does the reader make corrections when the miscues are not meaningful (monitoring)?

Unaided Recall Analysis

Unaided recalls are what the reader remembers and can tell about after reading a passage. Analysis of recalls provides a way of inferring what readers are doing as they remember and recall the text. It is a means used to attempt to discover covert processing through overt behavior and Fagan suggests the following questions (Fagan, ibid, pp.90-91)

I. Does the reader remember exactly what was read (text - specific information)?

2. Does the reader recall information from several parts of what was read and put it in a single sentence or clause (text information is synthesized)?

3. Does the unaided recall include information not specifically from the text but drawn from information the reader already has (prior knowledge schema) which was used to make inferences, generalizations or elaborations?

4. Has the reader recalled information in error indicating that erroneous relationships have been made between the stored knowledge (schema) and the new knowledge being added through reading?

For analysing text recalls, the categories used by Fagan (1984) and Malicky (1987) are based on the work of Drum and Lantoff (1977) and are a refinement thereof.

Music Reading

Alfred Hewson (1966) describes two fundamental concepts of teaching music reading. One involves teaching from the specific to the general, from parts to whole and could be referred to as "bottom-up". It involves separate drills on each technique step. These techniques are then combined and used to tackle new material. Carl Orff and his followers use this approach in building a child's music experience.

> It is Orff's belief that children should be allowed to discover music by themselves, starting on a simple, almost primitive level. By encouraging creative expression and beginning at elementary levels of music expression, the child is not immediately indoctrinated into sophisticated classical music, neither is he expected to master difficult instruments such as the piano or violin before he has experienced music.....Instead, he is led gradually from natural speech patterns to rhythmic activities; to melodies growing out of these rhythmic patterns; to a simple harmony (Thresher, 1965, p. 44).

The second concept could be referred to as "top-down" and proceeds from the general to the specific (whole to part). The child, in this approach, experiences a musical problem in a natural setting. After repetition of the music, the child eventually feels the need for some verbal theory and it is then, after the child has experienced the concept, that the problem is isolated and explained verbally. This is built on the concept that children learn better from experiences than explanations and that they can understand notation only as a result of musical experiences; that is, music itself should precede the rudiments (world knowledge before skill development).

In Hungary, where the Kodaly approach to teaching music reading is widespread in the schools, the philosophy is that children must sing every day. Bennett, in reviewing the philosophy notes that the belief is that if children were allowed to speak only once or twice a week (referring to the practice of the general music program in our schools for classes to be given twice a week) they would never learn to speak or read or write (1987, p. 36)! Richards, who adapted the Kodaly approach and materials so they would be suitable for children in North American classrooms, points out that in Hungary children do not begin instrumental study until they have a thorough ability to read and sing (1963, p. 28). The children grow up with the idea that music is like language and should be naturally and easily read. Unfortunately, most of the children with whom string teachers in the public school system work have a very limited musical background in the home and often a limited experience at schools where few music specialists are available or may be considered unnecessary by some administrators.

Many great minds have spent years devising methods for teaching children to play stringed instruments. Four contemporary methodologists are Applebaum, Bornoff, Roland and Suzuki. As violinists, they have extended their literature and pedagogy to be suitable for the three other major string instruments (viola, cello and bass). The first three methodologists are concerned with the teaching of strings in groups in schools, whereas Suzuki has geared his method to children in families which become involved in their children's total musical education from early pre-school years. Although everyone would like whole families to be involved in children's education, it is not the case, and the first three approaches are geared to families where the children essentially rely on the school system for their musical education. Each of the methodologists has produced a detailed philosophy for teaching technique, or mechanical facility, on the instrument. Some give definite directions on how, and sometimes even when, reading should be introduced and outline a sequence of music literature to be covered, somewhat similar in nature to the basal readers of text reading programs. In some approaches there is a tendency for the user to become curriculum centered and, although the developer may not have intended it, for the approach to become inflexible.

Bornoff's approach is based on the Gestault theory of learning. Technically, the children are introduced to the use of all five fingers for fingering and five major bowing techniques at the first lesson. The playing of the student develops gradually from doing all these with poor gross motor control to eventual fine motor control. After a few weeks of playing tunes and exercises "by ear", the students are provided with a book of simple folk-like tunes (the first five of which they have played previously "by ear") familiar to students up to about the 1950s and 1960s and a book of exercises that the students have been playing. They are provided with the visual representation of what they have played without music. There are as many as fifteen lines of music on each page and the notes are quite small. The students are expected to gradually make sense of these notes. Teachers are directed to do a few lines of several sections of the book so that the students get used to seeing large numbers of notes without being frightened by them. In this approach, there is a large amount of literature which teachers are directed to use and which exploit the techniques being learned and refined. This approach is similar to the whole language approach in text reading in its attempt to go from experiencing all the varieties of techniques on the instrument to the eventual refinement of individual skills, but unlike whole language, it does not encourage "free reading" outside of the "basal readers" prescribed.

Applebaum has a complete set of music books for use in multi-instrument groups, homogeneous or heterogeneous grouping, with technique books, individual solo sheet music, orchestra books , scores and duet books at all levels of reading experiences. The books have moderate sized notes and as many as eight lines on each page. Applebaum has re-arranged many good pieces of music to be played by young performers and has provided books which can be used at every level, introducing techniques one by one, both in the mechanical and reading techniques a string player must acquire. His approach might be called "skill oriented" as the focus is on introducing one part of a skill at a time, but at the same time a variety of experiences are expected (solo, small ensemble and orchestral playing) from the beginning.

Hence, although skills are added one at a time, his approach is holistic in that much reading is expected to take place in a variety of contexts.

Roland has also a set of books for young performers in groups. These books and a set of videos give directions to teachers and young performers, but again the focus is on the mechanical development of skills required to play the instrument.

All of these approaches can be, and sometimes are, used with individuals as well as in groups so they are not limited to the group approach even though they have been developed with groups in mind.

The Suzuki approach is based on children and an adult member of the family playing by imitation or "by ear" for many years in imitation of the "mother tongue" method of learning to speak . The family listens daily to tapes of the music the child will be playing and gets used to the instrument with one technique being introduced at a time through play and imitation. The theory is that if children are exposed to good music and good playing as part of their everyday life from birth, they will learn to play in the same way as they learn to speak. It is a holistic approach in the sense that their life experiences (background knowledge) are built first although technique is added in small portions. Its proponents believe that learning to read music is important , but do not give advice on when or how this is to be achieved. However, it is suggested that they learn to read music at about age six when the same skill is being acquired at school in text reading. This approach most closely resembles the pre-reading experiences one hopes that a child who will be learning to read text has had, that of listening to good literature being read to them, or being surrounded by good examples of other members of the family reading, and of frequently being read favorite stories they will be reading for themselves eventually. This approach has a defined and carefully laid out curriculum with sets of pieces to be learned, similar to the basal readers of some classrooms.

Other major pedagogues of the string community who have played and taught or are still playing and teaching string instruments other than violin have published materials related to their instruments. Well known among these are cellists Ticciati (1958) and Anderson (1985) and bassists Karr (1987) and Emery and Slatford (1988). Their books also have detailed information on how the instruments should be taught with literature to use in the teaching. On reading, however, the instructions in these books may be as brief as, "Reading skills should be developed as soon as possible" (Emery and Slatford, 1988, p. vi). These instructions do suggest that the process of learning to play the instrument should begin with singing, aural training, physical exercises and movement to develop rhythmic co-ordination (ibid, 1988) but do not provide philosophy, suggestions or directions on how this might be achieved.

Although each of the music methods or approaches has a particular and detailed philosophy for teaching technique, or mechanical facility, the research on how children read print has not appeared to be used to assist children to read music.

Interactive Processes Orientation and Music Reading

In studying the theories of how children read written language, we can find many possible or suggested similarities in needs for music and language. Fagan (1984) in his Interactive Processes Orientation Model suggests that the teacher take cues from learners and structure the learning experiences so that they can activate those processes and strategies and knowledge that will make for successful reading experiences. His belief in the importance of prior knowledge and the reader's purpose in the reader's interaction with print could equally be applied to music symbols. In fact, it makes a meaningful addition to the "mother tongue" beliefs of Suzuki , taking it a step further into the area of how children who speak (play) music language can learn to read music language. Referring to written language, it has been stated that, "Reading begins with the first acquisition of oral language and continues through life" (Duffy, Sherman & Roehler, 1977, p.38). This implies continuous interaction and schema development. Mursell, about music reading, concurs with those studying the reading of written language when he writes that music reading should be viewed "...not in terms of immediate forced mastery, but of long-term, continuous growth" (1952).

With respect to Smith and Fagan's beliefs in the importance of background knowledge, Gordon (1980) writes that short-term memory is relieved and assisted by long-term memory in music and that we assist music comprehension by enlarging resources in long-term memory through many music experiences.

He suggests that when we hear music we relate it to music we have heard before (long-term memory) and fit it in with what we are hearing (short-term memory) using this memory combination to predict what might come in the music, giving it form and meaning.

Gordon believes that audiation, the ability to recall or recreate music in one's mind without the music being sung or played, is an essential readiness skill for the reading of music:

> ...After basic audiation is developed, learning to read and write music is relatively simple. Just as students learn to read and write a language after they have acquired a functional vocabulary of words, so students learn to read and write music, that is notationally audiated, after they have acquired a functional vocabulary of tonal patterns and rhythmic patterns (Ibid., p. 7)

Gordon appears to mean that we must be ready to develop the background experience, or schemas, of music readers if we are to be successful in helping them learn to read. "The function of teachers is not so much to teach reading as to help children read" (Smith, 1978, p.3).

Fagan writes that, in the teaching of reading, if rules are stressed, the children remember the rule rather than what it is for. Frank Smith, who believes that the study of phonics is useful only when a student can already read, is echoed by Gordon as he compares music notation and phonics learning:

> ...knowing the alphabet, or even reading phonetically by recognizing the letters in print has little to do with reading comprehension......The letter names and time value names of notes represent the alphabet of the music language. To be able to recite or identify the letter names and time value names of notes does not indicate a readiness to read music... In themselves, individual notes have no meaning except as one takes meaning from them to explain partially the basic theoretical structure of the music language when one can already read. (Gordon, 1980, p.4)

Fagan and Gordon agree that, when we read, we give meaning to words as a result of experience with the objects or ideas that the words symbolize. Gordon writes:

> ....One gives meaning to the pattern one reads in music because one can audiate notation. As a result of being familiar with the sound of the pattern through basic audiation (as one is familiar with the sight of the object the word symbolizes in a language), one can read that pattern with meaning through notational audiation.....It is futile to try to precede audiation with theoretical understanding; to do so prevents giving comprehensive musical meaning to the pattern... (Ibid p. 5)

Gordon's writings, along with those of Fagan and Smith, give credence to the music teachers who believe that children should hear and experience music before being given "theory" and that when music reading is introduced, that it should relate to their musical schema, to their musical experiences, and to their background of knowledge.

Many of Gordon's views were earlier stated by Hewson who wrote in 1966 in the Music Educator's Journal that children understand what they see in notation only as a result of their musical experiences. He states that children must experience music before the rudiments - the experience before the explanation. This relates directly to Fagan's notion of "schema' or " world knowledge" as being one of the major determinants of reading success.

Mursell, writing about music readers states: "a good reader does not spell out the notes one by one"(1956,p.169). He could be writing about readers of written language who are not reading when they spell out words letter by letter. Similarly, when Gordon writes,

> One does not read music names or definitions, on the contrary, one hears groups of notes (patterns) as one reads....... (1980, p.4)

we could substitute "words" for "notes" and be quoting from many of the leading sources of theory in language reading.

In conclusion, there appear to be many similarities between text and music reading. Some of these which have been gleaned from the literature include:

1. Building background knowledge is important for both text and music reading.
2. Reading experiences are important before the introduction of theory, notation rules or phonics.
3. Time is needed for continuous and gradual growth in reading text and music.

Summary

In the last several decades there has been an increasing focus on how children process information as they read although researchers have been describing, developing and examining reading processes since the early 1900s. The Interactive Processes Model (Fagan, 1987) used as a basis for this thesis has evolved from the early models. Analysis of miscue and unaided recalls reading are used to explore the processes being used by students as they read. There are many parallels and similarities between the writings on text reading and music reading. On the basis of these similarities, it seems logical to collect samples of students' reading in music and language, analyse how they read each, and determine if there are any relationships between the processes they use as they read the two types of material.

Chapter 3

DESIGN OF THE STUDY

Introduction

In this chapter, the design of the study is presented. Included is a description of the sample, data collection techniques, scoring of instruments, and analysis of data. The purpose of the study was to investigate the music and literature environment of a small group of children and to examine in detail what processes they use to read both print and music materials.

Sample

The sample consisted of eight students in string classes with the Edmonton Public School board who were in Grades 6 to 9 and who had played cello or bass for two to eight years. Three of the students appeared in their classes to have major music reading problems and five appeared to have minimal difficulties. The students chosen were at varying levels of competency in reading music and had varying backgrounds of experience in music and numbers of years of playing. The only common denominator was that they were all taking group instruction in strings. Students in the bass and cello classes were selected because those are the instruments I teach principally and with which I had already experienced some difficulty in teaching music reading. In this way I felt that classroom observations and experience with the children could be added to what was being discovered through interviews and testing. Table 1 presents the age, grade, musical experience, reading test scores and I.Q. scores for each of the subjects in the study.

The Instruments

Data for this study were gathered through interviews, observation, administration of reading tasks and information taken from school records. Interviews were conducted with teachers and family members. Music and print reading tasks were administered to the children.

Interviews

Information was acquired regarding the background knowledge of the children and the home and school context in which they operated in an attempt to discover information which might help in understanding how they read.

Where possible each child's general music teacher at school and the classroom teacher who had responsibility for the child's language arts component at school were interviewed. The purpose of these interviews was to find out what sort of approach was being used at least for the most recent year in the child's reading program and to get another teacher's impression of how well the child read and what the teacher had observed about what processes the child appeared to be using to read. The interviews were not conducted using a formal question-answer technique but rather in a free flow of information about the child from the teachers' experiences.

In addition to interviewing each student's teachers, members of the family were interviewed. In some cases just one parent was involved in the interview, in some both parents, and in some families the children, both the subject of the study and siblings, became part of the interview, with the children themselves offering information about their experiences and materials in the home. These interviews were also informal, and the method and members involved reflected the family's style. The interviews were taped and transcribed.

Though the interviews were informal, I was consistently looking for the following information about each student:

a. the home and school background of music and literature listening experience;

b. the background of print reading and instrument playing and reading experience;

c. what materials and instruments were used in the home and school;

d. the parents' background of music and print reading experiences;

e. what member(s) of the family had been most influential in supporting the children's explorations and what kind of support was given;

f. what type of approach was favoured and/or had been used in teaching the children to read written language and music; and

g. what the home and school's perception of the student's achievements were.

School Records

Permission was received from the Edmonton Public Schools and the parents of the students for access to the cumulative records of each student. Information about students' past reading achievements and the history of their reading experiences and music participation was gathered from school records to enlarge the background of information about the students. Intelligence quotients from each of the group tests administered in the schools at Grades 3 and 6 were recorded. The purpose of gathering this information was to add to the profile of the student his/her possible potential. All of this information served as a context from which to interpret or make inferences on processes likely being engaged in by the student during reading.

Print Reading Test

To try to keep the testing as close to a normal classroom situation as possible, an informal reading inventory was used. Informal reading inventories have been used for years to assess children's reading of print material. For the purposes of this study, the Bader Reading and Language Inventory (Lois A. Bader) was selected because it contains both narrative and informational passages at levels from preprimer to Grade 12. The passages were designed to enable the assessment of comprehension and word recognition abilities of a reader. There are three forms of the test and the form designed for use with children, adolescents or adults (C/A) was used in this study. It includes passages suitable for the maturity of the student which were written or adapted for the inventory. Questions for prompting recall are passage-dependent and literal. Inferential questions are included separately and not included in the

Table 1

Student Age, Grade, Music Experience and School Test Results

Student	Age in Years & Months at test time	Going into at time of testing	Instrument tested on and years of study	Other instruments played and years of study	Scores on E.P.S. Reading Tests %ile Reading Ranks								Intelligence Quotient (Canadian Cognitive Ability Test)					
					Gr. 3 Decode	Gr.3 Comp.	Gr. 4 Decode	Gr. 4 Comp	Gr. 5 Decode	Gr. 5 Comp	Gr. 6 Decode	Gr. 6 Comp.	Gr. 3 Verbal	Gr. 3 Quant.	Gr.3 Non-Verb	Gr. 6 Verbal	Gr. 6 Quant	Gr.6 Non-Verb
IVAN French Immersion	11 yr.7 mo	Grade 7	Bass - 1	Cello - 2	71	63	In resource room- no scores						106	114	108	105	112	113
DUKE French Immersion	12 yr.3 mo.	Grade 7	Bass - 5	Cello - 1 Violin - 3	abs	abs	48	68	63	83	abs	abs	102	104	104	101	97	104
PAT French Immersion	12 yr.6 mo.	Grade 8	Bass - 5	Choir - 3 Piano - 1	no scores available				71	71	78	67	111	103	108	106	92	96
REBECCA	12 yr.7 mo.	Grade 8	Bass - 4	Viola - 1 Piano - 1	no scores available		91	95	68	86	91	98	135	141	126	116	117	118
NICHOLAS	12yr.11 mo	Grade 8	Cello - 5		98	99	99	99	97	99	98	99	148	143	134	144	115	130
GILLIAN	13 yr.1 mo	Grade 8	Cello - 5	Pre-school Choir - 4 Piano - 3	92	87	79	95	94	96	91	84	131	130	112	124	111	116
JOAN	12yr.11mo	Grade 8	Cello - 5	Choir - 3	92	63	41	47	89	58	72	64	114	104	107	110	105	114
RAY French Immersion	13 yr2 mo	Grade 8	Bass - 7	Pre-school	no scores available		98	90	74	61	97	99	115	117	130	119	118	124

scoring. To estimate the grade level of passages at which to begin testing, students were given word lists to read. The word lists consist of a series of ten words at each level from preprimer through eighth grade and a list designated as high school.

Music Reading Exercises

Several sight reading exercises and tests have been devised for the human voice (Richards, 1963) and many have been particularly adapted to the wind, brass and percussion instruments. In these exercises, however, the particular skills and strategies used by string players as they interact with new music have not been an important focus. String players must not only see the note and relate it to a sound, a pitch of a fixed duration or rhythmic value, they must also relate it to bow placement, speed of bow, direction of bow , bow pressure and choice of an appropriate bowing technique with their right hand. As well, placement of the correct finger of the left hand in the best position for the group of notes being read, along with additional considerations for tone such as vibrato and choice of string on which to place the notes are important details which must be considered.

A series of music reading exercises was developed for use in this study with the assistance of Claude Kenneson from the Department of Music , University of Alberta. Initially, we attempted to develop a series of music reading tasks of graduated difficulty using as a model the informal reading inventory for written language. An attempt was made to present additional music reading complexities in each exercise to discover how the child approached and processed the information from music that he could easily interpret through to that which presented frustration. A description of what concept in music was being investigated or presented in each exercise, is presented in Table 2. The actual exercises are provided in Appendix A.

Pilot Study of the Exercises

After completion, the series of music reading exercises was piloted with a group of university students in Mr. Kenneson's bass-cello beginner class. These students had varying backgrounds of instrumental training and music reading from minimal to advanced. All were at the end of their first year of cello-bass. Most had not received any training on a string instrument previously, but some had played violin or viola and were more advanced in their physical coordination with the instrument and their knowledge of markings which are peculiar to string music. In this sample the range of competency of the younger students to be used in the study was represented. A number of errors in the exercises were discovered and corrected. Prior to administering these exercises to the study group, five individual bass and cello students, from beginner level through to students who were in high school (having studied the instrument for ten years) were given the music reading tests to further check the corrected and revised form. It also gave the administrator experience in giving the test so that a uniform method of administration would be established.

It became clear from this piloting of the music reading exercises that except for the first few, they were not in order of easiest to most difficult. Each of the exercises requires a string reading skill that applies to reading music for that instrument. As the exercises progress, the difficulties are increased due to the complexity of the symbols but it was difficult to classify the great variety of different kinds of reading skills as "easy" to "difficult". However, this was not considered a major problem as the purpose of the instrument was to observe processes applied by students to music reading rather than testing or checking on a "music grade level".

Administration of Tests

All the tests were administered individually and the Bader Reading and Language Inventory was administered first. The students were first given graded word lists to read aloud to determine the highest level at which no more than one word was identified incorrectly. Then students were asked to begin reading passages at that level in order to ensure that they would experience success on the initial passage read. Each student was administered passages until frustration level was reached according to criteria presented in the Bader Reading and Language Inventory. In some cases the students were able to complete all the passages to grade 12 levels at instructional and independent level although the highest grade of the students in the study was grade 8. The students were given each passage and asked to read it silently. They were told they would be asked to read the passage aloud when they had finished and to try to remember what they read so they could summarize what was read

Table 2

Concept Requirements of the Music Exercises

Exercise #	Left Hand	Right Hand - Bowing	General Concepts
1	Open strings - no left hand	Bow speed - notes of different duration String crossing	Rhythm-quarter,half and whole notes
2	Open strings - no left hand	Directional marks for up and down bows Bowing at the tip	Rhythm - rests added
3	Fingering on a single string	Bow speed and bow placement on each string	Rhythm-quarters,halves, whole notes - quarter and half rests
4	Fingering across the strings	Slurs and portato bowing added Slurred string crossings	
5	Cello - extended 4th finger for C#		Eighth notes, speed
6		Slurred syncopation and string crossing	Rhythm - syncopation
7	Shifting		
8	1/2 position for bass	Bow speed and placement Portato bow	Combination of syncopated and unsyncopated rhythms
9	Shifting and harmonic		Syncopated and unsyncopated rhythms
10	Key signature requires extended 1st finger for cello and 1/2 position for bass		Rhythm - 3/4 time with rests
11		Bow speed decisions with 3/4 rhythm	
12	Bass shifts - 2nd & 4th position Harmonic for bass Cello shifts-4th,3rd, ext.2nd positions	Bow speed	6/8 time
13	Cello - extended 1st finger, shift on G string to 4th position, string crossing in position Bass - combined 1st & 1/2 position		6/8 time with addition of dotted eighth and 16th notes.
14			5/8 time - 2 + 3 concept
15		Cello-double,triple,quadruple stops Bass - double stops	
16	Cello - shifting to 3rd & 4th position		Tenor clef
17		Spiccato	16th notes
18			Minor key, slurring, tone
19	Thumb position		Treble clef
20			Non-diatonic exerciseddesigned so students have no clues or expectation through the context for their reading.

following the reading, and/or answer questions about the passage. After the oral reading, the students were asked to relate all that they could recall from the passage. If they left out any details in their summary, they were asked questions that would prompt recall of those details. Their recalls were marked off on a list of details from the passage. Usually three graded passages were given.

Following the Bader tests, the students were given time to tune their instrument, or were helped with the tuning. They were then given each music passage to read one at a time, being asked to read it over silently before playing the passage on the instrument. After they played the passage, they were asked to recall as many details about the music as they could remember, and were asked questions to prompt recall if details were not supplied in their summary. As many of the twenty music reading exercises as the student could handle without becoming very frustrated and/or tired were administrated, beginning at the first exercise for less advanced students and about exercise five for the more advanced.

Students were observed and taped as they played through the exercises, specifically to see:

1. how they solved the problem of bringing meaning to the music;
2. what kinds of mistakes they made when they encountered difficulties and reached frustration point;
3. what they did to make corrections when and if they realized that errors were occurring. The different combinations of rhythmic, pitch and technical problems in the music exercises elicited different individual reactions,

depending on the strengths and weaknesses of each student. Comments made by students during the pre-reading and any overt physical reactions (such as foot tapping, quiet fingering) during the silent pre-read were written on the administrator's copy of the test and considered part of the data.

After the tests were administered, the students were asked for their perception of how they read and what they did when they encountered music or words with which they were unfamiliar or which presented difficulties. Some were unable to respond, but the responses of those who could verbalise thoughts about how they read were recorded. The testing took between two and three hours per student depending on his/her reading facility and his/her approach to the task. Some students took time to carefully "pre-read" silently before playing, whereas others just plunged into the reading with very little time taken to look over the passage.

Coding, Scoring and Categorizing of Data

While students were reading the passages in the Bader Reading and Language Inventory and the music exercises, the students responses were taped and recorded on the examiner's copy of the exercises. After the testing was completed, the recording was used to confirm miscues and transcribe recalls.

Miscues

The purpose of classifying miscues was to discover the extent to which readers engaged in top-down, bottom-up or interactive processing. For example, in music if the miscue followed the rules but was musically unacceptable due to intonation or rhythmic insensitivity, this would indicate a bottom-up type of processing. An example of a top-down music reading miscue would be one that would involve students misreading notes or other symbols (inaccurate reading), but making their performance musically acceptable through calling upon their music experience and knowledge to play meaningful, though inaccurate, music.

The miscues were coded and scored using guidelines from the Bader Reading and Language Inventory. These guidelines are outlined in Table 3. I developed the guidelines for coding and scoring the music exercise miscues and based them on those used for text-reading passages. Ms. Miyo Inouye, music specialist and string teacher, was consulted for an informed outside opinion on the validity or appropriateness of these guidelines. The guidelines for coding and scoring the music reading miscues are detailed in Table 4. The miscues were then categorized. Guidelines used to categorize students' miscues were based on those suggested by Goodman and Burke as modified by Malicky (1987) and are given in Table 5. Categorizing of music test miscues was developed to follow as closely as possible the guidelines used for the reading tests, allowing for the difference in medium and the added dimension of coordination required on an oral (playing) reading of the music. The guidelines for categorizing students' miscues on the music exercises are given in Table 6.

Table 3

Guidelines for Coding and Scoring Text Reading Performance (adapted from Bader, 1983)

Behavior	Coding	Example	Score
Substitutions and mispronunciations that disrupt meaning	Write response above word	cocky he ran quickly	one
Substitutions, mispronunciations, and inversions that do not disrupt meaning	Write response above word; draw curved line for inversions	looked he stared at her.	one half
		"It was good", he said.	one half
Repeated substitutions or mispronunciations for same word	Write response each time, but count one error	penny penny the pony was...and then the pony	one
Insertions	Write the word with a caret	little a pony	one
Omissions and partial omissions	Draw a line through word or word part omitted	the fast runner walked through	one
Words pronounced by the examiner	Wait at least five seconds;write "P" above aided word	P He brought	one
Repetitions of words or phrases	Write "R" above each repetition; draw a line to indicated number of words repeated; score as one regardless of repetitions	R R the lion roared	one
Self -corrections	Write "C" above corrections	C cream I creamed the soup	zero
Repetitions to make corrections	Write "C" above corrections	C went I walked	zero
Hesitations	Put a check above each hesitation	✓ She brought	zero
Substitutions and mispronunciations resulting from a dialect	Write the deviation from the text	be goin' She goes every day	zero
Ignored punctuation	Put an X over disregarded punctuation	was done. Then	zero
Phrasing	Insert lines to indicate phrasing	the/cow/walked into the barn	zero

Table 4

Guidelines for Coding and Scoring Music Reading Performance

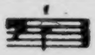
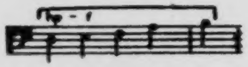
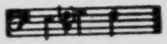
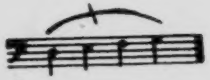
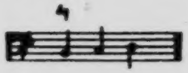
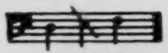
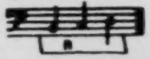
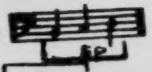
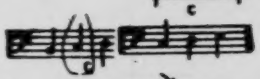
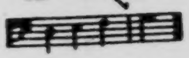
Behavior	Coding	Example	Score
Intonation-one note out of tune	Write "f" over note if flat,"sh" over note if sharp		one-half
Intonation - a group of notes out of tune bvecause the hand is not in position properly.	write "hp - f" above bracketed passage if flat write "hp - sh" above bracketed passage if sharp		one
Rhythm or note played is different from that written	Write in the pitch played		one
Group of notes played in different pitch than written	Write in the pitch played		one for group
Different bowing written than played or added bowings not marked, eg. slurs	Mark what bowing was done with the music notation above the printed bowing		one
Repeated missing of key signature	Write the sign of the accidental played or not played above the note - or write the pitch of the note played beside the written note		one
Notes omitted	Draw a line through the note(s) omitted		one
Repetitions of notes or phrases	Write "R" and draw a bracket around the notes or phrases repeated		one
Changing tempo midstream	Write "sp" above or below the part altered in speed;bracket section		one
Self corrections or repetitions to make corrections	Write "C" above the correction and bracket the section if it involves more than one note		zero
Hesitations	Check mark above or just before hesitation note		zero
Inversions that don't alter the musical meaning	write in what is played above what is written		one half

Table 5

Guidelines for Categorizing Print Reading Miscues

Type of miscue	Category	Explanation	Example
Graphic Similarity	Y	High similarity between what is written and the error 50% or more of the letters in the written word are represented, not necessarily in the same order	"bombs" is read for the written word "bomb" "invention" for "innovation"
	P	Partial similarity between what is written and the error Some letters from the written word are in the word read	"from" is read for the written word "to" "t.v." is read for "television"
	N	No letters from the written word are in the word read	Insertion of words not in the text Omission of a word in the text "the" read for "for"
Sound Similarity	Y	50% or more of the sound units of the word written are represented in what is read	"foremost" is read for the written word "most" "through" is read for "though"
	P	At least one of the sound units of the written word is represented in what is read	"partition" is read for "partisan" "had" is read for "that"
	N	No sound unit of the written word is represented in what is read	Insertions or omissions of words from the text "t.v." is read for "television" "though" is read for "thought"
Grammatical Acceptability	Y	The miscue is grammatical in relation to the rest of the passage being read	Substitution of "invention" for "innovation"
	P	The miscue is acceptable in relation to the part of the sentence preceding the word, or with the part following the word	"to the era of sailing ships" for "to the era of the sailing ship"
	N	The miscue is not grammatically acceptable with the part of the sentence preceding or following it.	What is read is not a word - "disasterly" for "dastardly" An insertion or omission that is not acceptable to any part of the passage
Semantically Acceptable	Y	The miscue is meaningful in relation to the rest of the passage read	
	P	The miscue is meaningful in relation to the part of the sentence preceding or following but not both.	
	N	The miscue is not meaningful.	"partition" for "partisan"
Meaning Change	Y	The author's meaning is not altered	leaving out "the"; "was" for "were"
	P	The author's meaning is partially altered.	"foremost" for "most" "sliced" for "slice"
	N	The author's meaning is greatly altered.	What is read is not a word - "partition" for "partisan" "regionized" for "recognized"

Table 6

Guidelines for Categorizing Music Reading Miscues

Type of Miscue	Category	Explanation	Example
Bowing	Y	Minor difference from musical intent of score	Down bow for up bow marking
	P	Partial difference from score that results in minor musical difference	Playing spiccato for staccato Slurring 2 and 2 when slur of 4 is marked
	N	Major difference from score that results in major musical difference	Playing spiccato or staccato when marked legato Not slurring when marked
Pitch	Y	Minor difference from score - a technical rather than reading difference	Playing passage with correct fingering but on the wrong string so that passage sounds correct but isn't.
	P	A difference from score that is not obvious to reader - a miscue easily made	F# to F natural when the sharp is indicated in the key signature but not marked next to the note - flats also
	N	A major difference from the score	Not playing an accidental marked next to the note A note played that is different from that which is written
Rhythm	Y	Small error that doesn't disturb the rhythm	Playing a note for less than its value but completing the rhythmic requirement of the measure with rest time
	P	Partial error that doesn't disturb the total rhythmic feel of that section of the passage	Playing a group of notes rhythmically correct with each other but with tempo for the group increased or decreased
	N	An error which is a major disturbance to the rhythmic flow of the passage.	Missing a beat or adding a beat in a measure such as playing a dotted half and quarter rest as a half note with a quarter rest so measure is short one beat
Intonation	Y	So slightly out of tune that it is almost imperceptible to the listener	Very slightly out of tune - or wrong note played in tune so pitch is wrong but intonation isn't - an F# for F natural
	P	Not in tune but not greatly disturbing	Moderately out of tune
	N	Greatly disturbing to the listener	The right note played, fingered correctly, but very obviously out of tune
Musical Acceptability	Y	Makes musical sense - the error doesn't detract from the total musical effect	A different note played than what is written but the wrong note fits into the passage and could be right.
	P	Makes some musical sense - the error only slightly disturbs the total musical flow	
	N	The error doesn't make any musical sense and greatly disturbs the musical flow	A badly out of tune note, a rhythmic error that disturbs the rhythmic feel of the piece
Composer's Intent	Y	The composer's intent is not altered	Played exactly as written, but slightly out of tune (a matter of degree)
	P	The composer's intent is partially altered.	Accurately read, but slightly out of tune (a greater degree than "Y"
	N	The composer's intent is greatly altered.	Might be musically acceptable, but isn't what was written by the composer

Unaided Recalls

In classifying recalls, the writer was trying to determine the extent to which students brought experience and background knowledge to the reading tasks.

Recalls were divided into clausal units. Mazes and recall conventions (space-fillers such as "uh" or meaningless word repetitions) were eliminated from the recalls. Then clausal and incomplete clausal units were categorized. A clausal unit is considered to be a group of words with an explicit subject and predicate and an incomplete clausal unit is one which is missing a subject or a verb. Guidelines used for categorization of students' unaided recalls from the Bader Reading and Language Inventory passages are based on suggestions from Fagan as indicated in Malicky (1987). These are detailed in Table 7.

Music recalls were divided into information units; eg. "Key of A", "3 sharps", "6/8 time" are examples of incomplete clausal units. As in text reading recalls, mazes and recall conventions which did not add to the information relating to the music were eliminated from the recalls. I developed the guidelines for categorization of students' unaided recalls of details observed in the music exercises in consultation with Ms. Miyo Inouye and based them on the guidelines used for the text reading recall categorization. Table 8 outlines these categories.

Relationship of Music and Text Categories for Coding Miscues

For this study, it was assumed that in oral reading readers of text are

Table 7

Guidelines for Categorizing Unaided Recalls on Print Reading

Category Symbol	Title of Category	Description	Explanation
A	Text Exact	Rote recall	Verbatim recall or minimal variations. Partial recall in which words are left out
B	Text Specific	One unit of text included in the recall	Pronoun substitution - eg. "they" for "people"; "it" for "truck" Elements synonymous - same meaning - semantics and grammar are acceptable, but active becomes passive or unit is paraphrased.
C	Text Embedded	More than one unit of text is included in the recall unit	Embedded information that can be matched to the text Noun for pronoun substitutions.
D	Text Entailed	Generalization from more than one unit of text	Synthesis - can't be matched exactly to the text Vague statements in which one term is exact from the text. A rational statement that is correct, but vague.
E	Inferential	Information added by the reader but constrained by text	Added by reader by using world knowledge (schema) Could involve - logical reasoning.
F	Experiential	Information triggered by associations to text information and not constrained by the text	Insertion of adverbs and modifiers as added elaboration Experiential intrusions - information related but not constrained. Storyline additions from the reader's experience with stories
G 1	Text Erroneous Specific	Errors in specific text information	Dates and proper names wrong Substitutions, expansions, additions that are conceptually wrong Contradictory information Erroneous embeddings - one reference information confused.
G 2	Text Erroneous Non-specific	Errors in "D", "E", "F"	Inaccurate or incorrect synthesis - wrong generalization Contradicts real life and not in text Faulty inferring - wrong inference taken from text information

Table 8

Guidelines for Categorizing Unaided Recalls on Music Reading

Category Symbol	Title of Category	Description	Explanation - Example
A	Exact	Rote recall of what was written	"Harmonic" "Two sharps" - what is seen visually with no added explanatory detail
B	Partial Recall	Same meaning	"A Harmonic" or "G Harmonic" "A#, F#, Bb - specific identified details of key signature
C	Embedded	More than one unit of the music described in a single statement	"There were no rests." Similar rhythm or rhythmic pattern identified
D	Entailed	Generalization - more than one musical unit described in a single statement and more vague than in "C"	"There were some slurs" "some shifting" "Similar rhythmic pattern" or "rhythm"
E	Inferential	Description of music requires prior knowledge Information is not directly "stated" in the music	The key of a piece as suggested by the key signature The meaning of the tempo marking What shifts were suggested by fingering markings Common time as 4/4 time
F	Experiential	Information triggered by the music, not necessarily related to the music, but suggested by the music - generalized statements	Elaborations - added information from experience Judgements about the music - "This is like the last piece" "It was like a song I've heard"
G 1	Text Erroneous Specific	one reference confused, but the rest is correct correct	Major for minor key when they have the same key signature
G 2	Text Erroneous Non-specific	wrong generalization from the text	The wrong key stated than is actually indicated by the key signature .

performing as musicians do when they play music they are reading. To decide if the process categories for the analysis of the miscues in music and text reading were related and how they should be aligned, I tried to analyse what sort of processing would be represented by successful reading.

Graphic similarity/Bowing similarity. The text reader must know what symbols in text are relevant and what are not. So must the music reader. A readers' ability to process the letters in a word or decode bow instruction symbols for an instrument require the ability to pay attention to the graphic/visual cues and analyse them. Down bow (⊓), up bow (V), slur (⌒), staccato (• •), portato (⌒ ‒ ‒) symbols above notes indicate a particular kind of bowing. If students' bowing matches these symbols, they are:

a. attending to the music, knowing that these symbols are significant and that meaning may be gained from them.

b. analysing the symbols and associating them to a remembered meaning or skill they have learned.

Sound similarity/Pitch similarity. Pitch seemed naturally to relate to the category of sound association because to be successful music readers, students must associate a sound with the position of a note on the staff. In order to have accurate pitch, the reader must analyse the clef, key signature and note symbols and associate them with remembered sounds. Some students in the testing for this thesis were attending to the visual cue for the pitch of the note but were not really relating it to a sound. Instead they were relating each note to placement of a finger at a certain position on the instrument. There are many places on the instrument where a player may achieve the same pitch with a variety of fingerings and hand positions, so the hand placement must be associated to the sound that the reader attaches to the symbol for pitch.

It was difficult to make decisions on a single category of text reading to which each of the aspects of music reading was related. It was thought that pitch belonged with both the graphic and sound categories of reading since it appeared to be related to both attention to visual cues and sound association and needed to be processed in both ways. It was then thought that in text, also, one must see and know which of the graphic cues are significant in order to attach a sound to them. It is thus assumed that in order to associate a sound to a visual cue in music the reader must already have attended to the visual cue.

Intonation. A reader of music might play the notes slightly out of tune but still be at the accurate general pitch with the correct fingering. If the music is played or sung out of tune, it doesn't make sense to the listener (it is noise rather than music). Some people who try to play an instrument do not seem to be able to listen and discriminate the fine differences between playing a pitch and playing it in tune. The difference between sound being offensive noise or pleasurable music is similar to listening to reasonable discourse or nonsense words. Because intonation involves processing that couldn't be attached to a single category, it was placed between the categories of Sound Similarity and Graphic Similarity.

Grammatical acceptability/Rhythmic acceptability. Rhythmic accuracy is extremely important and requires much skill in processing . Without accurate rhythm, the other components of music are quite meaningless; for example, a note at the right pitch in the wrong rhythm is the wrong note.

In order to impress students with the importance of rhythm, I have used the following demonstration for classes of students. I have sung or played for them the national anthem with all notes equal rather than the correct rhythm. No students have recognized it. I have beaten out the rhythm of the anthem without singing the notes and several have recognized it. Accurate rhythmic interpretation of symbols requires that the reader associate the right sound not only with an individual symbol, but with a group of symbols. Rhythmic acceptability depends on context. It is a prerequisite for making musical sense Music does not sound right if it is not rhythmically acceptable.

To be grammatically acceptable in text reading, the rules of grammar are followed sometimes involving several changes to make a phrase or sentence sound right even though the grammatical structure is changed. Rhythmically this is also possible. When one of the students in the study altered the rest of the rhythmic symbols in a measure of music to make up for a miscue at the beginning of the measure so there would be the right number of beats, he was ultimately making it grammatically acceptable. He was making it "sound right".

Semantic acceptability/Musical acceptability. Music may be played somewhat incorrectly and still make sense. If a note or a phrase or the rhythmic figure was substituted but still fit into the phrase and made sense, it was considered to be acceptable musically.

Author's intent/Composer's intent. The question of whether or not the reader had managed to take the meaning that the author intended from the text is related to achieving the composer's intent in music reading. A reader may substitute words or phrases which have the same meaning as those written and still be achieving the author's intent even though it is not accurate text. The reader is said to be getting the same meaning as the author intended A reader cannot be considered as achieving the composer's intent if anything is substituted. Composer's intent as I coded it was stringent, i.e. readers were not following the composer's intent unless they played the music exactly as written. Because of this difference, significant differences in the scores between music and reading in these categories can be expected.

As with language, it is impossible to really separate any of these aspects of reading into separate, unrelated categories. In both, all the categories affect one another and the processes overlap. What we are doing in categorizing the miscues is trying to determine which processes might be in use.

Interrater Reliability

To achieve interrater reliability on categorizing print and music reading responses, the Arlington formula was used (Fiefel and Lorge, 1950). The interrater reliability achieved was:

Bader: .89 Interrater reliability on Recalls
.93 Interrater reliability on Miscues
Music Exercises: .91 Interrater reliability on Recalls
.92 Interrater reliability on Miscues

Dr. Grace Malicky, reading specialist, was the other rater for the Reading Tests and Ms. Miyo Inouye, music specialist, was the other rater for the Music Test.

Analysis of the Data

When the coding and categrorizing of all the miscues and unaided recalls were complete, I added up the number of responses that were in each category and calculated the percentage of miscues in each. The percentage of miscues in the "Y" category (that is, closest to what was written as outlined in Tables 5 and 6) and the percentage of unaided recalls in each category as outlined in Tables 7 and 8 were brought together on tables. Only the instructional level was ultimately used for the formal analysis on the belief that we learn more from analysing what students are doing when they are being successful.

The scores from music and reading responses were brought in line with one another as described in the section on the Relationship of Music and Text Categories for Coding Miscues. All the scores were examined to discover general trends and individual profiles. Comparisons were made between responses in the music and text reading categories and inferences were drawn.

Chapter 4

RESULTS AND DISCUSSION

Introduction

This chapter will profile each student used in the study, bringing together information acquired through the interviews with parents and teachers and information from school records. For each student, an analysis of the coding and categorizing of the reading in text and music will be presented in tables. An interpretation of the processing engaged in by each student, arrived at from an analysis of the tests of each, will be given. A comparison of the processes used for text and music reading will also be made. The chapter will conclude with a table presenting all the students' results and a discussion of how each student's reading profile relates to the general findings for this group of students. A comparison of the differences and similarities between music and text reading processing will complete the chapter.

Ivan

Home and School Background

Ivan is the last of six children in this family-centred home in which all of the children have been involved with music, books and computers. Ivan's father is required by his work to travel a great amount so that the training of the children has been done principally by the mother but it is a traditional family in which the father's influence is very great in spite of his frequent absence. This is shown through his authority which is respected and his support of, and presence at, his children's activities when he is available. Although the family expects the children to achieve, these expectations are not repressive, but instead related to the children's abilities and physical and emotional development. There have always been many books in the home and Ivan's mother has always read to all the children.

Ivan's family lives in the city on weekdays and works on their farm during most weekends, particularly during the warmer months of the year; however, they remain in the city when the children's activities require this. A piano, balalaika (played by the father), drums, synthesizer , violin, banjo, guitars, trumpet, cornet, bass and recorders are present on the farm where, with fewer distractions than in the city, their family musical evenings are more frequent. These involve family singalong and playalong evenings as well as musical evenings with neighbors , following a tradition begun with the parents' families. They have a piano and other instruments in their city home as well. The family concentrates most of its resources on books, music instruments and education for the children.

Both parents believe that music is a very important part of family life. All of the children have been given piano, recorder and string and/or wind instrument instruction as soon as it was offered at school. The last four children have been part of the same program of study as Ivan, one on cello, the others on violin-viola and bass. The older children assist and encourage the younger so Ivan has been the recipient of much advice and help at home. The children hear all kinds of music including the country type at country dances with live music when at the farm, classical recordings and their own currently popular music.

Ivan's physical development, including coordination, is viewed as being about two years behind his chronological age. Both his teachers and his mother explain that in all that he does he experiences frustration because he understands everything but has difficulties translating this knowledge and understanding into the oral (reading aloud) or physical (playing the bass) modes. An older brother shared this lag in physical maturation but "caught up" in his later teens. Ivan enjoys his musical instruments more when they don't present reading problems to solve while playing and plays frequently "by ear".

Ivan is in a French immersion program at school. His teacher for two years of this program believed in providing meaningful language experiences and planned the reading program to correlate with their other studies and the interests of the children. She was frustrated by the limitation of the students' French vocabulary and the lack of French materials at both their interest and vocabulary level . Ivan's mother and teacher are both sympathetic to his difficulties in expressing himself. His teacher noticed that in Grade 3 he began to improve his oral skills. His mathematics achievement has always been very good. Ivan's mother believes that he is beginning to read well at school but that his music reading is still behind where it should be.

The family philosophy is that children need positive reinforcement for their successful learning and that success in reading language and music is greatly increased with praise. They believe that the teacher is the key to children's success in learning, whatever method is followed. Ivan's family likes the group method of music instruction because it presents music as a recreational activity to be done with others as well as a skill to be learned. They have tried to keep a balance between encouraging their children to play "by ear" and from music notation.

The whole family has always been involved in music and the question of a child's choice to study an instrument has involved only choice of instruments. It is expected that they will be involved with music and look forward to it. Ivan began studying the cello and switched, after two years, to the bass. He is more enthusiastic and devoted to overcoming the technical difficulties of this instrument.

Profile of Ivan's Text Reading

When Ivan read text, many of his errors were those of omission of words ("so that it sliced" became "so it sliced") insertion of words, usually articles ("hearing newscasters" became "hearing the newscasters"), or substitutions of function words ("war in the Pacific" became "war of the Pacific"). This caused the percentage of miscues coded high in graphic similarity to be low as these would all be coded as having no similarity. "Break" for "breaking", "gold rush" for "gold rushes" are examples of his other types of miscues. These show that he was attending to the graphic cues though sometimes leaving off endings. Table 9 shows that miscues were graphically similar to the actual text only 35% of the time, indicating that he was not bound by the text, although he was analysing graphic cues some of the time.

Ivan's score rose dramatically in grammatical acceptability and his reading made sense. Some of his miscues consisted of words of the same meaning being substituted for the text word (eg. "had been" for "were"). This showed that he was actively processing the text, synthesizing and predicting and monitoring as he read even though he may not have been reproducing it exactly. He relied on his language and world knowledge to predict words. Sometimes he left out words altogether, but maintained grammatical and semantic acceptability. In the passage where he read, "gold rush in California" for "gold rushes in California and Australia", he did not maintain the author's intention but he did use his predicting skills to make it sound right and make sense.

Table 9

Ivan: Percentages of Miscues Scored High at Instructional Level

	Text Based			Knowledge Based			
Text Reading	Graphic Similarity	Sound Similarity		Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected
Music Reading	Bowing Similarity	Pitch Similarity	Intonation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected
Text	35	31		65	65	69	31
Music	94	81	75	38	13	13	22

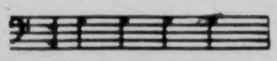
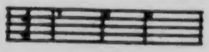
Ivan's miscues showed that he was not a text-based reader. He was making more use of his background knowledge and his knowledge of language to make predictions and he successfully monitored 31% of his miscues. Because he sometimes altered the text so that it would remain semantically acceptable, his miscues were high in similarity to the author's meaning only

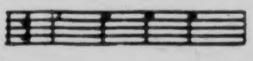
35% of the time, confirming that he was not highly constrained by the text.

Ivan's unaided recalls covered most of the categories indicating that he was employing a balance of attention to the text and use of background knowledge. No responses in the "A" category reflected the miscue analysis finding that he was not dependent on the text. Fifty percent in "B" and "C" categories, however, indicate that he was attending to the text, analysing and associating. Fifty percent D/E/F recalls indicate that he was synthesizing and generalizing information from the text, making inferences and elaborating on what he had read. He made only 3% errors in his recalls indicating that although he was not attending closely to the text, he was analysing the text sufficiently to recall accurately what the author had written. Table 10 shows the coding of unaided recalls.

Profile of Ivan's Music Reading

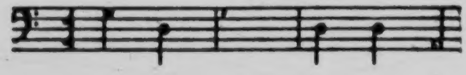
Ivan attended very closely to the graphic cues and generally was able to associate pitch with the symbols he read and synthesize them into appropriate intonation. However, his score on rhythmic acceptability, a major prerequisite for making musical sense, showed that he was having difficulties reading the rhythm message in the symbols (Table 9). He sometimes altered the rhythm following a miscue so that the rhythm for a measure was accurate or made musical sense in spite of the miscue. In these cases he was also predicting so that his reading made musical sense. For example, in an open string exercise (which did not require additional processing for pitch through fingering), he altered the measure by omitting a note so there wouldn't be an extra beat in the bar after he gave the first note two beats in error:

 became 

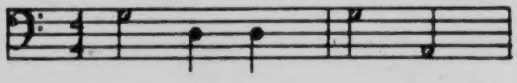
which is musically meaningful instead of 

which would have been musically unacceptable in 4/4 time.

Another rhythmic error which showed that he was predicting for musical sense, is shown in the following example:



became



He left out two quarter notes to maintain the rhythm.

In general Ivan was not able to make musical sense (see table 9) or maintain the composer's intent. His text-dependence was not sufficient to maintain the composer's intent because of the rhythmic errors. Rhythm being a prerequisite for making musical sense, his music acceptability score reflected this difficulty.

Table 10

Ivan: Percentages of Unaided Recalls at Instructional Level

	Text Based			Knowledge Based			Text Error			
	A	B	C	D	E	F	G 1	G 2	Recalls Not Prompted	Inference Questions Answered Acceptably
	Text Exact	Text Specific	Text Embedded	Text Entailed	Inferential	Ex-periential	Text Erroneous Specific	Non-Specific		
Text		25	25	19	12	16	3		76	69
Music	14	12	14	31	12	6	6	4	69	38

Ivan's music reading recalls covered all the categories, including the text erroneous category (Table 10). His recalls reflect his ability to analyse the information from the symbols and his familiarity with the structure of written music. His "D" responses indicate that he was synthesizing information from across the score. Sometimes his responses involved use of background knowledge inappropriately (G 2), resulting in a few errors. He commented occasionally on errors during the testing to say, "I'm guessing on this, but..." and "I guess I better learn how to read key signatures", when he couldn't recall what they were. This showed that he was monitoring his performance and had metacognitive awareness of his weaknesses.

Comparison of Ivan's Text and Music Reading

There was a marked difference in Ivan's dependence on graphic cues in music and text reading. Table 9 shows the great difference in the categories of graphic and sound similarity when compared with bowing, pitch and intonation similarity. Ivan's text reading reflected greater grammatical acceptability than his music reading reflected in rhythmic acceptability and greater semantic acceptability than musical acceptability. The difference reflects that he was drawing on his background and language knowledge more in text than in music. He sometimes did not maintain the author's meaning in his text reading and did not play what the composer intended in the music in spite of the fact that he monitored miscues in both.

Recalls coded as "A" were greater in music reading than in text reflecting again the greater dependence on the visual cues in music reading compared with text reading. His A/B/C responses in music and his "B" and "C" responses in text show that he was analysing and associating. "D" recalls were more frequent in text than in music reading, showing that he was getting the main idea of what he read in text and making more gist-like statements which reflect synthesizing and generalizing. His greater dependence on background knowledge in text reading than music reading is reflected in the difference of his scores in the "F" category which reflect use of background information related to the text but not constraint by it. Ivan made few recall errors in either text or music reading.

Duke

Home and School Background

Duke is the middle child of three in a family of musicians. The parents, who play guitar and sing, have a family band which includes the daughter, who is the eldest child and plays the violin both classically and as a fiddler, Duke who has played bass with the band since he was in Grade 4, and the youngest child who is beginning to play the fiddle with the group as well as to sing and dance with it. They perform regularly in local country music engagements as well as in other parts of Alberta and Canada at exhibitions, dances and folk festivals. The father plays several instruments including harp, mandolin and banjo as well as guitar which he teaches in their home. All the children sing, too.

The children listen to most kinds of music including old time country, blue grass, country and jazz. They listen rarely to classical music although they are all being classically trained on their instruments. They have all been trained musically from an early age starting with the Kodaly pre-school program and continuing with violin (and bass as well for Duke).

The children have been read to every day since they were very young. There are magazines and books in the home, the boys' favorites being Owl and Asterix. They were enthusiastic about the C.S. Lewis Narnia series and still enjoy being read to. Their mother is the one who reads to them most. However, they don't have much time for reading because of the time taken by school, lessons, practice and performing, and there is very little television viewing.

Duke's mother reports that he has always liked going to school because he is very social and still thinks school is a great place to go to play. His father perceives him as being play-oriented rather than work-oriented in all that he does. If he likes something, he is very singleminded about achieving it. Otherwise, in reading, for example, if he doesn't know something and isn't interested, he just says anything and slides over it instead of stopping to work it out. His mother favours an approach that combines whole word recognition and phonics and a similarly balanced approach in music, combining auditory (learning tunes by ear) and the reading of musical symbols.

As well as being away from school while on the road with the family band for performances, Duke has a number of major allergies which have interfered with his school and music lesson attendance. His teachers at school have been quite concerned about these absences. They perceive the family as being too casual in their attitude to schooling and not consistent with what the teachers believe is his need for strong discipline to become a good musician.

Duke is in a french immersion class. The emphasis was reported to be on phonics in the earlier years with a move in the last year to a more integrated approach. His most recent teacher assessed his reading in English as not strong but with good decoding skills and better than his French reading. His French reading and writing are still seen as superficial; that is, he doesn't seem to become interested in or able to interpret ideas in any depth. "He's not a strong reader but his decoding skills are good." The teachers believe that he is typical of the members of the class with whom he has moved through the French immersion program who are not a particularly linguistically oriented group, though a good average group in other areas.

His latest teacher's summary of Duke's school performance is that he has difficulties writing in both French and English but that he isn't having trouble with reading. She described him as a proud and persistent student who, when he is frustrated, keeps tenaciously at the teacher until an explanation is given that makes sense to him.

In his music lessons, Duke doesn't learn well through theory and rules. He likes to hear the music he is to learn first and depends more on that than on the music he sees. He does not remember fingerings for theoretical exercises such as scales even when they are presented frequently in a variety of ways but will remember a scale passage in a piece of music he likes. If he works out a rhythmic passage of a tune incorrectly, or hears it played incorrectly at first, it is nearly impossible to correct his perception of the passage. He continues to play it with the first-heard or first-perceived rhythm. He perceives himself as not being able to read music.

Profile of Duke's Text Reading

Duke was attending to the graphic cues and analysing them as indicated on Table 11 by the fact that 56% of his miscues were graphically similar and 50% had high sound similarity to the text words. An examination of his semantic acceptability score (75%) show that he was associating , synthesizing and predicting to maintain meaning. For example, "it sliced" became "it would slice" and "iron with wood planking" became "iron and wood planking". He was also using his knowledge of language structure to predict and monitor as he interacted with print, altering the words following a miscue so that the passage would be grammatically correct; for example, "clippers were" became "clipper is". He was using his monitoring skills very effectively to achieve the 45% score in miscues corrected. A balance of dependence on graphic cues and background knowledge was also reflected in his high score on author's meaning.

Fifty-eight percent of Duke's unaided recalls were coded as "B" and "C" indicating reliance on text cues. He was attending to and analysing graphic cues, associating meaning with them and synthesizing words within and across sentences. His distribution of responses across D/E/F categories indicate that he was using the processes of generalizing, inferencing and elaborating(Table 12). In addition to these recalls, his lack of recalls in the G (erroneous recall) category reflect his effective use of his text information and his background knowledge.

Table 11

Duke: Percentages of Miscues Scored High at Instructional Level

	Text Based			Knowledge Based			
Text Reading	Graphic Similarity	Sound Similarity		Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected
Music Reading	Bowing Similarity	Pitch Similarity	Inton-ation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected
Text	56	50		75	75	94	45
Music	100	69	100	6	6	0	32

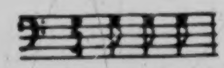
Profile of Duke's Music Reading

In music, Duke's miscues indicated a high dependence on visual cues (see Table 11). Bowing and pitch similarity were high indicating that he was attending to, analysing and associating sound with the symbols for pitch and bowing accurately. He often corrected the pitch if he made a miscue. For example, in one passage he missed a shift the first time but played it accurately the next time it appeared in the score. This illustrates that he was monitoring his reading as well.

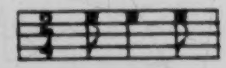
At frustration level, he played the right pitch with the hand not quite in the right place and left it there so that the whole passage was out of tune though the fingering and pitch were correct. At that level he was not monitoring for musical sense, having not achieved enough automaticity to go beyond attending to the graphic symbols. At instructional level, he made corrections in intonation, monitoring for musical sense in terms of intonation and drawing upon his musical knowledge.

In rhythmic acceptability, a prerequisite for making sense, Duke was not using his background experience to monitor and obtained a score of only 6% (see Table 11). It may be that he was focussing on pitch and intonation and had not reached a sufficient stage of automaticity to focus on rhythm as well. For example, on a repeated rhythmic pattern which he played consistently wrong while pitch and intonation for the passage were accurate, he was able to identify the rhythmic pattern in his recall of the music. For example:

he played

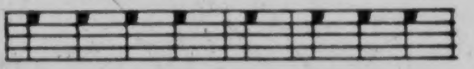


for

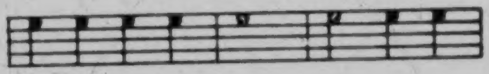


Other miscues clearly showed that although he was attending to the symbols for pitch, he was not attending to the rhythmic aspect of them:

he played



for



Because of his major rhythmic difficulties, few of Duke's miscues were musically acceptable and his music reading did not reflect the composer's intent. Nevertheless, he corrected 32% of his total miscues which revealed that he was actively monitoring as he played.

Forty-five percent of Duke's unaided recalls were in the "A" category which reflected a strong dependence on visual cues (Table 12). He was attending to, analysing, and making association to the visual cues. He was drawing on his background knowledge to make gist-like statements as is shown through 24% of his recalls being "D". Duke had no responses in the E category and he answered only 20% of the inference questions correctly from which we can infer that he was relying very little on his background knowledge to infer as he recalled music. His 9% G 1 (an erroneous response that involves an error in one referent on an otherwise correct recall) showed that he sometimes processed visual cues ineffectively.

Table 12

Duke: Percentages of Unaided Recalls at Instructional Level

	Text Based			Knowledge Based			Text Error			
	A	B	C	D	E	F	G 1	G 2	Recalls Not Prompted	Inference Questions Answered Acceptably
	Text Exact	Text Specific	Text Embedded	Text Entailed	Inferential	Ex-periential	Text Erroneous Specific	Non-Specific		
Text		47	11	16	11	15			73	100
Music	48	14	5	24			9		70	20

Comparison of Duke's Text and Music Reading

A comparison of Duke's miscues in music and text (Table 11) show that Duke was attending, analysing and associating in both but depended more on visual cues in music than in text. Duke's significantly greater percentage of recalls in the "A" category in music than in text reading also pointed to a greater dependence on visual cues in music than in text reading (Table 12). These indicators of greater dependence on visual cues in music may mean that he had less confidence in his own experiences in music, less automaticity, or less understanding of how he could effectively use his music background experiences. Duke's text reading miscues showed that he used his background knowledge to associate, synthesize and predict to make sense of what he was reading and nearly always remained within the confines of the author's meaning. In music he was also monitoring to make musical sense but because of his rhythmic errors, what he played was not as musically acceptable and he did not maintain the composer's intent. His recalls representing use of background knowledge to infer and elaborate were more extensive in language than in music and in music he sometimes made errors in detail (G 1 recalls).

Duke had a low self-evaluation of his reading skills in both language and music. In responding to questions of how he read, in language he based his evaluation on his school achievement. When asked how he figured out unfamiliar words, he replied that:

> I think, syllable by syllable and kind of place them together ....but they weren't too hot, my English mark isn't too great .

This evaluation was given in spite of the fact that he was in Grade 6 when administered the Bader Reading and Language Inventory and didn't reach frustration level until he was reading the passages at Grade 11/12! Similarly in music, when he was asked how he worked out a difficult passage in music he said he read it over a couple of times and,

> you mean how did I figure out what I figured out even though it was mostly wrong? I kind of found out where the notes were and

> worked from there.

He also related some difficulties moving from violin to bass:

> I find it hard.....the fiddle mixes me up and.....when I play my fiddle with my sister, I always play bass fingering and when I play bass, I usually play the fiddle fingering.

This confusion showed up in some fingering errors but was not responsible for the problems with rhythm which is the same for both instruments. In fact, the experience on both instruments for many children helps to reinforce the skills they learn on each instrument for the other.

Pat

Home and School Background

Pat is a child who was born prematurely and given oxygen at birth. She has never needed much sleep and has always had trouble in school with consistency in learning. She is the second of four children and idolizes her older sister, whom she perceives as being "perfect". The elder sister tried cello but dropped it and took piano lessons for several years. Pat tried the bass for six years and piano for two years and has dropped them both. She has also loved and been active in singing which she still continues, attending summer camps and singing as soloist in school operettas.

Pat's mother reports that she has had many emotional problems at school. She is easily bullied as she won't fight back, but at the same time is very stubborn about things that matter to her. She speaks in almost a whisper and won't do things unless she wants to nor will she cooperate with a teacher she doesn't like.

Pat is in a French immersion program at school and reads in both French and English. Both mothar and father read to the children and their home is filled with reading material, including picture books, novels and magazines. Not very much television is watched as everyone is busy. The children see the parents involved with books for themselves, as the mother has been working on a masters' degree and her father is a research oncologist who frequently gives papers in a variety of countries.

In Pat's home there is music involvement particularly through the father who used to play in a band and had the group in their home to rehearse. It was through the sound of the bass player in the group that Pat was attracted to that instrument and began studying it in Grade 3. Three years later she began piano lessons to help her in her reading and theory for the bass. The father still plays Scottish tunes on the fiddle and still has friends in occasionally for a casual musical evening of playing. He has taken the children to several symphony and singalong concerts. In the family, the mother's sister and father were both very active musically.

A pattern of inconsistency is reported in Pat's response to her study of material in both school and in music. If she likes the teacher, she wants to take lessons, but that liking and taking doesn't involve performing consistently well for the teacher. Although she is reported to practice regularly, there seems to be a concentration or focussing difficulty. She might achieve satisfactorily one week or one minute of a lesson and then be altogether incapable of building on or repeating that achievement a minute later or a week later. Her school teachers and her music teachers have despaired over the inconsistency, irregularity and unpredictability of what determines how she will respond to tasks, and when her focussing will be directed. All the teachers have perceived that she doesn't appear to have a realistic view of her achievements and they suspect that she pursues and fantasizes perfection, losing focus and concentration on the task at hand as she does this. Although she seemed to want to be involved in music, her perception of achievement and not being able to focus on the teacher's instruction to make this achievement a reality, caused some difficulties. When she focusses on a task and follows instruction, there is evidence of no lack of ability or talent to achieve. But when she is upset about anything, real or imagined, she does what her teachers describe as "outrageous things" scholastically and musically. They observe a strong will and "mulish" response to attempts to help her back to accuracy.

In school and in music, Pat's reading has been taught through usage with rules being added when needed. Pat is not fond of any emphasis on theoretical aspects of learning.

Without realising how much work and discipline is involved, Pat has expressed a desire to become a great musician, but her mom believes that she doesn't have the drive to do so. She has always had encouragement from both parents for her school and extracurricular activities. However, the lack of consistency of achievement has led to great concern and eventual recommendation that unless she follows instruction as given, she give up her musical instrument studies. She chose to give them up.

Pat is a young person for whom one cannot help but have affection and concern. Much thought, time and caring have gone into helping her develop with few answers being found on how to help her learn, to help her make her desires become reality.

Profile of Pat's Text Reading.

Table 13 presents the percentage of miscues coded as being similar to the text. Pat's scores on graphic similarity and sound similarity were a strong indication that Pat was not depending principally on graphic cues when she made miscues in her reading. However, she did not make very many errors so her attention to, analysis of and associating of sound with graphic cues was better than these percentages suggest. Miscues she did make were principally of omission ("for easy conquest" instead of "for an easy conquest"), insertion ("have been done" for "have done"), and substitution ("iron and wood planking" for "iron with wood planking").

Table 13

Pat: Percentages of Miscues Scored High at Instructional Level

	Text Based			Knowledge Based			
Text Reading	Graphic Similarity	Sound Similarity		Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected
Music Reading	Bowing Similarity	Pitch Similarity	Inton- ation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected
Text	33	0		83	83	50	28
Music	78	45	45	11	0	0	27

Most of Pat's miscues were high in grammatical and semantic acceptability, i.e. they made sense and sounded right. Thirty eight percent of her miscues were corrected. These indicate that she was using her background knowledge and knowledge of language effectively to predict and monitor. Pat's score of 50% for author's meaning compared with 83% for each of grammatical and semantic acceptability indicate that she was depending heavily on her background knowledge and knowledge of language structure and not always being constrained by the text.

Pat produced 20% of her recalls in the "B" category which shows that she was attending to the text, associating meaning with words within clausal units. She had no recalls in category "A" which confirmed that she was not tied to the print. Twenty percent of her recalls were in category "G", indicating that she was taking information from more than one clause and synthesizing the information. No responses in the "D" category imply that she was not taking her synthesizing to the higher level of getting the main idea and generalizing. Her E/F recalls show that she was effectively using her background knowledge making inferences and elaborating from what she read (Table 14). She had a few recalls which were erroneous. These were in the G 1 category which indicates that she sometimes made errors in recall of detail.

Pat did not reach frustration level on miscues in any of the reading passages from Grades 7 to 12 but she did reach frustration level for recalls at the Grade 9/10 level. All her recalls were unprompted. Questions didn't help her to remember any details not already recalled although she was able to answer all the inference questions acceptably.

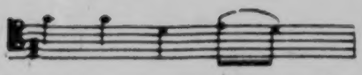
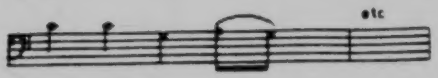
Table 14

Pat: Percentages of Unaided Recalls at Instructional Level

	Text Based			Knowledge Based			Text Error			
	A	B	C	D	E	F	G 1	G 2	Recalls Not Prompted	Inference Questions Answered Acceptably
	Text Exact	Text Specific	Text Embedded	Text Entailed	Inferential	Ex-perential	Text Erroneous Specific	Non-Specific		
Text		20	20		25	30	5		100	100
Music	45		10	20				25	58	0

Profile of Pat's Music Reading

Seventy-eight percent of Pat's miscues in music passages coded were high in bowing similarity (Table 13) indicating that she was attending to and analysing visual cues. In pitch similarity and intonation, the miscues at 45% similarity reflect that she was associating the appropriate sound nearly half of the time. Her miscues were rarely rhythmically acceptable, not ever musically acceptable (0%) nor were they ever close to the composer's intent (0%). Some of the exercises were unrecognizable because of one basic major and uncorrected error. For example, when she didn't notice the change of clef for the second half of the passage (Appendix A, Ex. 16, a repeat of the first half of a passage an octave higher) she played a fifth higher instead, so it was in the wrong key with the wrong notes, not sounding diatonic like the first half of the passage. Although this was coded as one miscue (the clef) it resulted in the entire second half of the passage being wrong and sounding wrong.

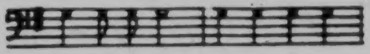
eg.  became: 

Pat's response was: "That sounds odd". She was monitoring and knew that it was wrong, but she didn't know why it was odd nor could she correct it. She was not using her background knowledge or predicting from the first part of the passage to guess that the second half should be similar to the first half.

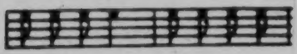
Although Pat knew the positions for the instrument, she often didn't use them. For example, in Exercise #5 (Appendix A) she played in the key of Bb but used first position all the way through instead of half position. This meant that she was playing out of tune or out of pitch on all notes that weren't open string. She was decoding the symbols accurately in terms of fingering and pitch but not associating the right position. Her interpretation of the lack may have been that the exercises weren't meant to make sense or sound right, or she may not have been attending to the sound and monitoring but concentrating instead on the visual cues.

Pat's rhythmic acceptability score was low (11%). Rhythmic acceptability is a prerequisite for making musical sense for a passage, and some passages were so rhythmically unacceptable that I couldn't code the passage as I was unable to figure out which notes played were meant for those written - I couldn't match her sound to the symbols. In those passages which I could code, 45% of her miscues were partially similar to the music which reflects that she was doing some predicting from her background knowledge to make musical sense. For example, a basic rhythmic concept is that each measure in a passage has the same number of beats unless there is a change of time signature so in reading a passage successfully, the number of beats that should be in the measure can be predicted. In the following rhythmic exercise the same number of beats per measure was written, but was played with a varying number:

eg:

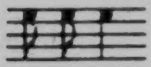


became:

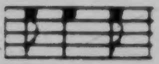


In the following example from Exercise #8 (Appendix A), Pat may have been unable to go beyond the analysis and association of the symbols for pitch so only partially processed the rhythm. She analysed and associated to the extent that she identified and played the note values of 1/8 and 1/4, but didn't play them in the correct pattern.

Pat played:

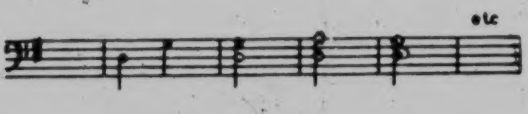


for:

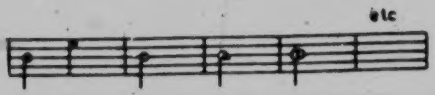


A later passage for which she played open strings only was rhythmically correct, though in that passage she played single notes instead of the double stops as written:

eg. written:



played:



She may have processed what she could and omitted the rest so the whole passage was accurate for the lower note and rhythm but wrong for the second simultaneous note. It may be that she hadn't reached sufficient automaticity to fit all parts together.

Sometimes there were inconsistencies. For example, for a passage in 5/8 rhythm that many students find difficult because it is not as familiar, Pat recognized that it was in an unusual rhythm, attended to it very carefully and played it more accurately than the other passages. In this case, not using background knowledge or predicting became an asset and did not interfere with accurate close attention to and analysis of the visual cues.

The 0% score on composer's intent tells us that she did not play what the composer intended, so that although she appeared to be monitoring her reading some of the time (corrected miscues 27% of the time) she was not monitoring sufficiently to maintain the composer's meaning. Some of her corrections were inappropriate; for example, sometimes in playing a passage, Pat would play it correctly and then would repeat the passage to "correct" it but play it incorrectly the second time. She was monitoring, but not using her background knowledge effectively.

In her recalls, nearly one-half of Pat's responses were in the "A" category (Table 14). She was attending to, analyzing and making associations with visual cues. Ten percent of her responses in the "C" category showed that she was synthesizing across larger units and her 20% "D" responses suggest she was making generalizations. She had no E/F responses which implies that she was not inferring or elaborating. Pat did not answer any of the inference questions acceptably. One quarter of her recalls were in the G (erroneous) category. These indicate that she wasn't using her background knowledge appropriately.

Comparison of Pat's Music and Text Reading

Pat's miscues were high in visual similarity significantly more in music than in text (see Table 13) which implies that she was more constrained by the visual cues in music. Her grammatical acceptability score at 83% was much greater for text than her 11% for rhythmic acceptability. These differences were reflected in the considerable difference between the semantic acceptability score for text reading (83%) compared with music acceptability (0%). From these scores we can infer that she was doing more predicting in text than in music.

Pat corrected approximately the same percentage of miscues in both text and music (Table 14) which shows us that she was monitoring in both text and music. Fifty percent of her miscues being high in similarity to the author's meaning but 0% of her music miscues maintaining the composer's intent suggests that she had a greater ability to integrate visual cues and background knowledge in text than in music. In text reading she was maintaining meaning, sounding right and making sense significantly more successfully than in music.

When instructed to look over the music before playing and to pre-read it to herself first, Pat took very little, if any, time to do this. Her playing was, in essence, "unprepared oral reading" rather than prepared. The lack of a silent pre-read culminated in her request at the conclusion of playing Exercise #7 (Appendix A) that she be allowed to play it again. She had monitored sufficiently to know that she had done it incorrectly. She may not perceive the task as being similar to text reading at all, and may not have understood that music can be pre-read silently in the same way as we do text.

In her text and music reading recalls, Pat had differences in all categories (Table 14). Fifty-five percent of her music recalls fell into the A/B/C categories compared to 40% of her recalls in text. She produced 20% of her music recalls in the "D" category compared with none in text reading. In music she had no recalls in the E/F categories compared with 55% of her text recalls. In her music recalls, 25% were in the G 2 category indicating inability to use background knowledge appropriately. These differences in the recalls substantiated the differences found in her miscue analysis (Table 13).

Rebecca

Home and School Background

Rebecca is the third of three girls in a family which moved to Canada from South Africa. It is a close unit with both parents being actively supportive of the children's activities and achievements. The children have always been read to by both parents and enjoy it greatly. There are many children's books and magazines in the home for their enjoyment and they are all active and enthusiastic readers.

The children have been taken to a great many symphony concerts and the mother plays classical music in the home. The children also play other kinds of music, though the eldest prefers classical and is actively negative about current popular music when it is played by her sisters in the home.

The family philosophy is that, except for school, the children partake of activities through their own choice and that it is strictly their responsibility though the parents give whatever help is necessary. Musical instrument study and continuation is by the choice of each child. The eldest has chosen to go into advanced musical study but Rebecca and her younger sister, both of whom started playing string instruments, have dropped strings. They both play wind instruments in the school band. After three years of bass, Rebecca says that she prefers to play the flute because it is easier to carry around. Although Rebecca took piano lessons for one year only, she still plays from memory the pieces she learned at that time and seems to enjoy her music as light recreation rather than as a discipline requiring regular practice.

Rebecca's mother believes that reading should be taught through a combination of practical and theoretical learning as well as hearing lots of music and stories. She believes that the written form should be present from the beginning so that children begin to recognize the symbol-sound association from the beginning. "I think it should be an enjoyable experience" sums up her philosophy.

Rebecca's mother and music teacher at school both perceive her as being a good reader. In her music classes at school, Rebecca was taught to read music through a formal music-reading developmental program using the recorder and singing. Her written language reading teacher did not wish to be interviewed but stated that Rebecca had no reading difficulties that she could ascertain.

Profile of Rebecca's Text Reading

Rebecca made only six uncorrected miscues. Of these six, four were insertions of an article ("heard about the mail order" for "heard about mail order") and one was omission of an article ("keep up with the growing demand" became "keep up with growing demand"). Only one was a miscue that slightly changed meaning and it was high in similarity to the graphic cues ("par-ti-shun" for "partisan"). She is, therefore, obviously reading effectively using all of the processes: attending, analysing, associating, synthesizing and predicting. She corrected 38% of her total miscues which showed that she was also monitoring.

Rebecca was at independent/instructional level to Gr. II/12 level in her reading accuracy. In her recalls she was at frustration level at the Grade 9/10 level. Eleven percent of Rebecca's recalls were in the "A" category and 39 % were in the "B" category. This confirmed that she was attending to the text cues and associating meaning with them. Rebecca provided few recalls and she didn't answer any of the inference questions acceptably. The production of few recalls, difficulty with questions and discrepancy between level of word accuracy and comprehension suggests that she may view reading more as a word identification than a meaningful task. However, of her few recalls, 29 % were in "E" category and 21% in "F" which show that she was inferring and elaborating, using her background knowledge as she was reading. Ninety percent of her recalls were unprompted, showing that she was structuring her own comprehension process.

Profile of Rebecca's Music Reading

Rebecca's miscues were all high in bowing similarity to the visual cues (see Table 15). In pitch, 83% of her miscues were high in similarity to the music score. Rebecca was attending to the visual cues and associating them with sound. Fifty-eight percent of her miscues were rhythmically close to the score and 58% of her miscues were high in intonation similarity. None of her miscues were musically acceptable, giving a picture of a reader who was not using background knowledge sufficiently to maintain musical sense.

Table 15

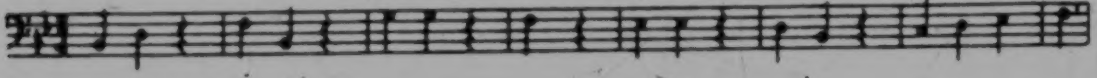
Rebecca. Percentages of Miscues Scored High at Instructional Level

	Text Based			Knowledge Based			
Text Reading	Graphic Similarity	Sound Similarity	-	Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected
Music Reading	Bowing Similarity	Pitch Similarity	Inton-ation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected
Text	Only 8 miscues						38
Music	100	83	58	58	0	42	9

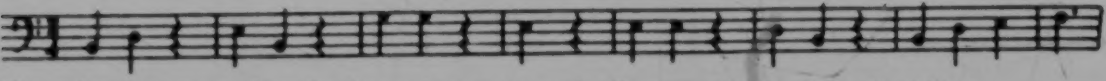
In the miscues, for example, Rebecca would play an F natural which would not sound right or be musically acceptable; in her recall, she would tell me that there was an F# in the key signature. She was obviously attending to the visual cues but not always associating them with the sound she was playing or monitoring her playing.

Rebecca did not make a large number of miscues at the instructional level, but those she made rendered the music unacceptable. For example, she played a passage with the correct fingering but with the hand out of position. This resulted in the sound of the fingered notes not being right with the open strings. Students who are predicting and monitoring would move their hand until the notes sounded right. Rebecca did not. A simple exercise which put her at frustration level because of her miscues demonstrates this (I have used a frustration level example as there was a greater concentration of the kind of errors which exemplified her processing):

for:



Rebecca played:



The miscues were visually close, but not musically acceptable. The fact that 42% of Rebecca's miscues were consistent with the composer's intent appears to reflect her concern with visual cues.

In her recalls, Rebecca's responses were 41% in the "A" and 15% in the "B" category (Table 16), indicating that she was attending to the visual cues and associating them with the sound. Nine percent of her recalls were "C" showing that she was doing some synthesizing and 20% were "D" showing that generalizations were being made. Six percent recalls in "E" category and 6% in "F" showed that to a lesser extent some inferring and predicting was occurring but not a significant amount.

Table 16

Rebecca: Percentages of Unaided Recalls at Instructional Level

	Text Based			Knowledge Based			Text Error			
	A	B	C	D	E	F	G 1	G 2	Recalls Not Prompted	Inference Questions Answered Acceptably
	Text Exact	Text Specific	Text Embedded	Text Entailed	Inferential	Ex-periential	Text Erroneous	Non-Specific		
Text	11	39			29	21			90	0
Music	41	15	9	20	6	6		3	70	0

After more than one exercise, Rebecca commmented, "That's strange!" and "It sounded strange!". This demonstrated that she was monitoring for musical sense, but she wasn't using her background knowledge sufficiently to know why it sounded strange or to make corrections. In a passage where she had many recalls, she commented, "it isn't a nice song or anything, it was exercises." (it was her interpretation of the visual cues rather than the visual cues themselves that made it "strange"). This revealed her interpretation of the task. She wasn't expecting to use her predicting skills to make sense of the passage because it was just an "exercise".

The final passage (Exercise #20, Appendix A) was atonal and had a variety of accidentals and time signature changes marked in the score. This passage requires a reader to attend closely to the visual cues. Monitoring and predicting and using background knowledge aren't useful to students in this passage. Rebecca played this passage in the same way as earlier, diatonic passages in which predicting and monitoring would have assisted her in making musical sense. Her comment at conclusion was, "it didn't sound like much". She was able to explain after playing the passage why it might be more difficult to play than the previous pieces though it wasn't so for her.

Comparison of Rebecca's Text and Music Reading

Rebecca's text and music miscues show that she was attending to visual cues and associating sound to them in both language and music (Table 15). In her text reading she used her background knowledge to synthesize, predict and monitor. In her music reading she used these skills to a lesser extent, depending more on the visual cues than on predicting and monitoring to make sense, although she did predict rhythm and intonation in 58% of her miscues.

In her recalls, Rebecca's responses echoed the reliance on visual cues in both text and music (Table 16) although her E/F responses in text reading showed that she was effectively using her background knowledge in text reading. She made fewer responses in the E/F categories in music. Her recalls in the C/D categories were greater in music indicating that she was synthesizing and generalizing more in music than text reading.

Rebecca's description of her reading of text and music helped provide a picture of how she viewed the tasks and may explain her less effective use of predicting and monitoring skills in music and her dependence on graphic and visual cues. When asked how she figured out unfamiliar words, she replied:

> If I haven't seen it, I try and sound it out and I try and look at the different parts of the word - like if I saw a "ph", I've seen it in other words so I know it's a "fuh" and I wouldn't say "p" , so it's the same - like I remember from the other things I've seen when I was learning them.

In answer to a question on whether a musical symbol evoked a sound in her mind, she replied:

> I don't hear a sound, but I know that (pointing to a note) is an open note cause I've seen it so many times.....I think.....I see.....an F sharp I know that it's 4 , I just know that.....or a C sharp, it's 4 on A. I don't hear anything ....I don't hear a sound.

This would explain why she would play the right fingering and not notice that it wasn't in the right place. She is not "audiating" in music as she does in text reading (sounding out) so has not related the two tasks or hasn't understood that music needs to be "sounded out" , too.

Nicholas

Home and School Background

Nicholas is the only child of his father and has an older half-sister and half-brother, both of whom are adults living away from home. His mother works full time and has since he was ten days old. He then had a Nanny who read to him daily and introduced him to art museum books filled with pictures by old masters. His mother, who is an elementary school teacher, read nursery rhymes to him. His father, a highschool English teacher, read Shakespeare to him "because he liked the sound". Nicholas started reading numbers before he was two, and played with calculators and calendars when he was two and three years old. He was able to recite the alphabet backwards (his own idea of fun) and read books when he was about four years old, having learned consonants from Sesame street on television and rhyming words from lists his mother would give him when he asked for them. In pre-school daycare, his favorite activity was to read books to the other children. By Grade one he had read the annotated Alice in Wonderland to his mother several times because he enjoyed learning about the background of the story and the puzzles the story presented.

There were no young children with whom to play in the neighborhood so Nicholas was essentially an only child living in an adult environment. He has been treated by family and friends as a person whose questions were listened to and answered seriously. He is very curious, task oriented and is viewed by his family as noncompetitive, one-minded and determined.

Nicholas has attended performances of the symphony, ballet and theatre when he was younger but not many in more recent years. He has travelled widely with his parents, including four trips to Europe. The music played in the home is mostly classical, though there is sometimes Rock music which the father likes and Nicholas does not. His father is the parent most interested in music, and his father's sisters all played wind instruments. His mother took piano for awhile but was never enthusiastic about music, though her eldest daughter is a singer.

Nicholas' father reports that Nicholas sees system in everything. He sees everything as organised with nothing isolated and everything part of a whole. His parents believe that a lifestyle with regularity and assurance of consequences of actions is important for children to see patterns in life and learning, and his home has been run on that tenet.

Nicholas' most difficult subjects in school have always been Physical

Education , Instrumental Music and Art; that is, those subjects which require physical manipulation. His Mother recalls that she was able to read early herself, but did not have the coordination for writing. She attributes this to late physical development which she believes Nicholas shares.

In Nicholas' cello lessons, he didn't practice regularly or achieve much until he was placed in a class that was well ahead of him. He started to practice and to monitor himself when he didn't meet the standard for the upper class into which he had been placed; that is, his achievement in cello was low until he was moved into a class with high achievers. When he became aware of what was possible, his perception of the possibilities for his own achievement changed his approach to the instrument and, ultimately, his achievement level. His family reports that he doesn't like the repetition needed for physical mastery.

Nicholas' parents believe reading of music should be taught through an integrated approach such as reading remembered patterns from listening, with tunes students can master, no matter how simplistic, as long as they can have a sense of accomplishment. Nicholas has not had difficulties reading music and rhythms once they have been explained to him. In his music lessons, which are group lessons at school, Nicholas' only difficulties have been with coordination and practical application through playing.

Profile of Nicholas' Text Reading

Nicholas made only four uncorrected miscues in his reading of text. Of these, three were omissions of a pronoun or article and one was a repetition.

As with Rebecca, this paucity of miscues suggests that he was making use of the processes of attending, analysing, associating, synthesizing, inferring and predicting. Twenty percent of his total miscues were corrected, from which we may infer that he was monitoring, also.

In his recalls, Nicholas produced 22% in the "A" category and 37% in the "B" category implying that he was analysing text cues and associating them to meaning. Thirteen percent of his recalls were in the "C" category and 8% were in "D" showing that he was synthesizing, relating ideas together, and going beyond to generalize. His percentage of recalls in E/F categories was similar to C/D (see Table 18), confirming that he was inferring and elaborating as well as synthesizing.

Nicholas' high percentage of responses in the A/B category (59%) suggests he is primarily a text based reader. However, his distribution of responses in the other categories, his lack of recalls in the "G" (erroneous) category and his answering of all the inference questions show that he was effectively comprehending the text and actively using his background knowledge.

Nicholas read aloud very quickly. On the rare occasion when he needed more processing time, he hesitated, taking the time he needed, instead of making a miscue. He gave his recalls almost as if he was presenting a memorized speech. He didn't waste any words or use mazes (sound which readers make to fill time while they are thinking, such as "uh.....") but paused quietly between words or sentences till he found the word or phrase he wanted.

His recalls were 87% unprompted.

Profile of Nicholas' Music Reading

In Nicholas' music reading, 100% of his miscues were coded high for bowing similarity and 77% of his miscues were coded as high in pitch similarity to the music score (see Table 17). He was attending closely to the print, analysing and associating. Thirty-two percent of his miscues were high in intonation similarity, and 50% of his miscues were high in rhymic acceptability (sounding right), a prerequisite for making musical sense. These percentages were lower than those for bowing and pitch similarity. They illustrate that he was doing some synthesizing and predicting, but not as effectively as he analysed and associated. The habit of making a slight hesitation rather than making a miscue in his text reading was reflected in his music reading and sometimes when scoring for rhythm, I may have mistaken a slight hesitation for a rhythmic miscue. His score of 54% in music acceptability reflected the rhythm score. Forty-six percent of Nicholas' miscues were high in similarity to the composer's intent indicating that his predictions were constrained by the musical score. Nicholas corrected 26% of his miscues showing that he was monitoring.

Table 17

Nicholas: Percentages of Miscues Scored High at Instructional Level

	Text Based			Knowledge Based			
Text Reading	Graphic Similarity	Sound Similarity		Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected
Music Reading	Bowing Similarity	Pitch Similarity	Inton- ation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected
Text	Only 4 miscues						20
Music	100	77	32	50	54	46	26

In the music exercises, Nicholas most frequent miscues were in intonation and hand placement. This was an indication that he was not monitoring carefully although he was reading and interpreting accurately the musical symbols. When he made a miscue, if the symbol was repeated a little later, he corrected it; if it didn't sound right the first time he would correct it the second time. For example, if he didn't play in the right key, he could tell by the sound of the passage and would remind himself of the key signature. It seemed that Nicholas thought in patterns. When the music broke the pattern, he didn't like it and would monitor or predict to fix it if it came again.

In his recalls, 40% were in the "A" category, confirming the picture of Nicholas as a reader who was attending closely to the score and able to extract information from it. His recalls were almost exactly what was on the page of the score. Only 1% of his recalls were in the "B" category. His recalls were principally an oral version of the printed score but 11% recalls in the "G 1" category indicate some errors in dealing with this information. He was also synthesizing (17% of his recalls in the "C" category) and compiling information to make generalizations from more than one part of the score ("D" category at 12%). His inferring skills were active with 17% of his recalls being in the "E" category but little elaborating was evident. He answered 100% of the inference questions acceptably and 79 % of his music recalls were unprompted so he was obviously organizing information and using his background knowledge, as well as the visual cues from the score,to make inferences.

Comparison of Nicholas' Text and Music Reading

Nicholas' few miscues in text reading and his miscues in music reading showed that he was using all of the processes of attending, analysing, associating, synthesizing, inferring and predicting in both (Table 17). He was correcting miscues in both text and music reading which showed that he was monitoring in both as well.

In his recalls, Nicholas showed that he was able to process text-based information. His recalls in music reading were higher in the "A" category than they were in text reading and in "B" lower (see Table 18). This may have been an interpretation of the task as being more a recounting of the symbols in music than in text, or it may mean that because he has less experience with music than with text, he was staying closer to the score to be safe.

Table 18

Nicholas Percentages of Unaided Recalls at Instructional Level

	Text Based			Knowledge Based			Text Error			
	A	B	C	D	E	F	G 1	G 2	Recalls Not Prompted	Inference Questions Answered Acceptably
	Text Exact	Text Specific	Text Embedded	Text Entailed	Inferential	Ex-periential	Text Erroneous	Non-		
Text	22	37	13	8	13	7			87	100
Music	40	1	17	12	17	1	11		79	100

Nicholas obtained similar percentages of recalls in music and text reading in C/D/E categories and more recalls in text than music reading for category "F". Nicholas "F" responses in music at 1% and "G" significantly higher at 11% reflect that he has much less experience with and background knowledge to draw upon in music than with text. His recalls in the "G" category were much greater in music than in text. Nicholas was asked to describe what he was doing as he silently pre-read. He replied,

> I look at a piece. I look at mostly the notes and my fingers. I sort of tap them on the cello or something to figure out how I am fingering, trying to imagine what it would sound like in my head...............but I'm not usually very successful......it doesn't sound anything like what I thought it was going to.......but sometimes it does. Occasionally. But most of the time it comes out rather different, especially on something like the last one (Exercise # 20 was atonal) cause they're difficult to tell what it's going to be (predict).

I asked Nicholas how he knew he was wrong when he corrected himself. He said:

> I think that sometimes what I do is....I sort of think slower on.....than.... faster, rather, than I do the ....I play something and then during the middle of the note I realize what the key signature was or what the time values were. I realize part way through that I've made a mistake. So I'm not thinking at the same speed as I'm playing.

Increased background experience may gradually bring the automaticity that Nicholas is referring to when he says his "thinking" is too slow for his playing.

In his music reading, Nicholas would hesitate rather than play a wrong note if, for example, he had to shift in a passage and wasn't sure of the shift. This was a characteristic of his language reading recalls - to hesitate, thinking before choosing words, instead of using fillers such as "uh". He appears to be quite methodical. He seemed to interpret the recall task as being asked to produce an exact rendition of the text.

Gillian

Home and School Background

Gillian is the youngest of two daughters in her family. Her mother teaches part time and her father is a dentist. Her father plays piano, organ and viola which he started when the eldest daughter took viola and continued when she dropped out of the class. He plays with an amateur string orchestra. Her mother has no musical experience but is very supportive. She regrets her background without music and has made sure that the children have been involved in music since they were four years old. Gillian has had a long and varied training in music, beginning with the Yamaha pre-school training and continuing with piano, singing and cello. In the home the family listens to classical, opera and "easy listening" music. Her mother's assessment of Gillian's music activity is: "she has a nice voice, is very musical, but needs to work at it harder". Gillian doesn't think of herself as competitive, but works for festivals and marks.

In the house, there are newspapers, a variety of magazines and novels from biographies to mysteries. There was never any baby talk to the children as they grew up, and Gillian learned much from her older sister. She learned to read when she was about 3 1/2 years old with the help of Sesame Street. Everyone in the family enjoys reading and even though they are busy with other activites, they read a lot. The children read a variety of materials. No restrictions are made on their choice of reading material. The children have always been read to and even though they are now teenagers they still enjoy the activity.

Gillian's mother favors a phonics approach to reading because she believes it helps children to spell. She thinks Gillian is a good speller because she had a phonics-based program at her school whereas her sister did not and is not a good speller. She believes the holistic approach is fine as long as the basics are there. In music, she believes there should be a balanced combination of technique and pieces so that the students don't put their mind into neutral during tedious exercises.

The family favours a group combined with individual lesson approach to teaching of music. They believe that Gillian has a good sense of rythm and a good ear which has helped her to develop in music.

Profile of Gillian's Text Reading

Gillian made only three uncorrected miscues none of which altered the text meaning ("and" for "with", "towards" for "toward" and "harmonous" for "harmonious"). We can infer from so few miscues that as she read she was effectively using the processes of attending, associating, synthesizing, inferring and predicting. She read quickly and corrected more than half the total miscues she made (see table 19) indicating effective monitoring as well.

Table 19

Gillian: Percentages of Miscues Scored High at Instructional Level

	Text Based			Knowledge Based			
Text Reading	Graphic Similarity	Sound Similarity		Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected
Music Reading	Bowing Similarity	Pitch Similarity	Inton-ation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected
Text	Only 3 miscues						71
Music	64	68	55	82	41	38	47

Gillian produced responses in all of the recall categories (See Table 20). Her responses were long and detailed, almost "chatty". She used many recall conventions (narrative comments not involved with the passage recall) and mazes (sounds made by readers to mark time while they are thinking).

Ten percent of Gillian's recalls were In the "A" category indicating that she was attending to the text cues. Twenty-one percent of her recalls were in category "B", considerably more than those in "A". These showed that she was actively associating meaning as she responded to the text cues. Although only 4% of her responses were in category "C", she had significantly more recalls in category "D" which was evidence of synthesizing and generalizing.

Table 20

Gillian: Percentages of Unaided Recalls at Instructional Level

	Text Based			Knowledge Based			Text Error			
	A	B	C	D	E	F	G 1	G 2	Recalls Not Prompted	Inference Questions Answered Acceptably
	Text Exact	Text Specific	Text Embedded	Text Entailed	Inferential	Ex-periential	Text Erroneous	Non-		
Text	10	21	4	15	23	23	4		79	67
Music	27	8	22	14	18	6	5		96	75

Almost half of Gillian's recalls were in the "E/F" categories This confirmed that she was using her background knowledge, inferring and elaborating, drawing on her experience of the world to comprehend the passages. Four percent of her recalls fell in the "G" category. This was a single recall which contained an erroneous referent in an otherwise correct recall in an exercise at the Grade 11/12 level.

In her reading, Gillian used both text knowledge (ABC categories) and background knowledge (DEF categories and few G category) to recall the author's message. However, she did depend more on her background knowledge.

Profile of Gillian's Music Reading

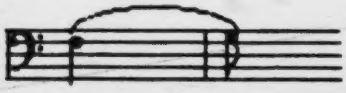
Gillian read through all the music exercises with few errors and didn't reach frustration level until she played the atonal exercise (Exercise #20, Appendix A), the only one for which she couldn't depend on her background knowledge and one which required close attention to the visual cues. Of the errors she did make, 64 % were high in bowing similarity to the visual cues and 68% of the errors were high in pitch similarity (see Table 19). Intonation was lower at 55% high similarity which is descriptive of my general observation of Gillian as a player who enjoyed the music but didn't pay great attention to detail, i.e. she was not a careful player, demanding that each note be perfectly in tune. Eighty-two percent of Gillian's miscues were rhythmically acceptable, a prerequisite for making musical sense, but her musical acceptability was considerably lower at 41% (Table 19). I examined the coding of her miscues more closely to see why this might be so, and discovered that it reflected her inattention to detail. If her 55% partially musically acceptable responses were added to her highly acceptable responses, her scoring would have been 95 % musically acceptable. Only one miscue was coded as not musically acceptable at all (5%). Similarly, in intonation, her high and partial acceptability totalled 95%, and only one miscue was coded as not acceptable.

Only 36% of Gillian's miscues were coded high for composer's intent showing that she was frequently not constrained by the score, and depended on her music experience as she read. Gillian's monitoring skills were active as shown by 47% of her total miscues being corrected.

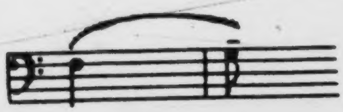
In her recalls, Gillian produced responses in all the categories. Twenty-seven percent of her recalls were in category "A", considerably higher than her 8% in category "B". This 35% of her recalls in categories A/B reflect that she was attending to the visual cues and associating. Her relatively high percentages in categories C/D show that she did analyse text but went beyond verbatim or paraphrase recall to synthesize text information in a new way (Table 20). These scores show that she was synthesizing text information and making generalizations. Eighteen percent of her recalls were in category "E". That was indicative of her use of background knowledge to infer. Five percent was a much lower percentage of recalls in category "F".

Only 5% of Gillian's recalls were in the "G" category. She recalled that there were slurs marked in a passage which had a portato marking (Exercise #10, appendix).

Gillian recalled:



for:



It makes a difference in how the music is played, but is visually very close.

Gillian's music reading was generally accurate and quick, errors being principally in the finishing touches, or detail. She used vibrato, making a good sound, and took time before reading to prepare and analyse each exercise.

She identified most errors she made after she had finished playing, obviously monitoring herself as she played. Comments before and after the music exercises were descriptive and revealing. For example, before a passage with syncopated rhythm throughout, she looked at it and said, "oh, boy", gave it a careful pre-read, played it accurately, and followed it with the comment, "I hate this kind of song". Syncopated rhythm is rhythm that many string players find difficult at first because it is not used as much in the early music they play as it is in, for example, band music.

After Exercise #9 (Appendix A), in which she made two errors, she said, "That was really terrible" about her playing. After playing exercise # 10 in which she played an Ab for an A natural, she confirmed that she was monitoring by commenting, " That wasn't supposed to be flat". At exercise 13 she asked, "Are these getting a lot harder?" but was quite relaxed and appeared to be enjoying the activity. When she was presented with the exercise containing the treble clef for which her automaticity was not as great she asked, "Is it ok if I play this very slowly so I can get some of the notes?". After playing it with a few expected errors she said, "I'm never going to forget that piece!" indicating that she had concentrated on the visual cues very closely. However, at Exercise #14 (Appendix A) she understood the 5/8 rhythm and explained it in detail during the recalls, but while playing it she made errors which put it into the more familiar 4/8 rhythm illustrating a greater dependence on her background knowledge in music and a lack of constraint by the visual cues.

In reply to an interpretive question asking why a fingering, which Gillian played, was marked in the text she said, " ....finger marking? I don't know... I don't think I saw it". This is descriptive of the automaticity that good music readers achieve; that is, there are many visual cues which are automatically analysed by music readers.

Comparison of Gillian's Text and Music Reading

Gillian's had few miscues in text reading and music scores across the categories which showed that she was using all the reading processes actively (Table 19). She was using both her background knowledge and visual cues to read music and text.

In her recalls, Gillian had more responses in the "A" category in music than in text and the reverse in the "B" category (see Table 20) indicating that she was paying close attention to specific text information more in music. This may be a reflection of what is necessary to notice and remember in music as it is read. For example, clef, key signature and time signature, all "A" type recalls, must all be attended to and associated before a passage can be played acceptably.

Gillian made a higher percentage of "C" responses in music than in text and her "D" responses were approximately the same (Table 20). She was synthesizing and making generalizations in both text and music. The percentage of her text and music responses coded "E" were similar. She was making inferences effectively as she interacted with the print in both text and music. Her recalls in "F" were significantly higher in text than music, implying that she was drawing on her background knowledge in text more than in her music reading. She had few responses in the "G" category consisting of an occasional inattention to detail in both text and music. Most of Gillian's recalls were unprompted in both language and music and she answered most of the inference questions acceptably in both.

In both her music and written language reading Gillian gave the impression of being fast although she described herself as a slow reader. In both text and music reading, Gillian integrated her background knowledge with her attention to the graphic/visual cues using all the processes. She made fewer errors in text reading. Her music errors principally involved inattention to detail. Her monitoring skills were well developed. Her recalls were "chatty", with many comments while she thought aloud as she organized her memories of the passage read. She appeared throughout the testing to be enjoying the exercises, treating them almost like a game.

Joan

Home and School Background

Joan is the youngest in her family and has an older brother. Her mother, an English-major, is a free-lance editor and her father is a professor. Their home is filled with magazines for adults and children (such as Owl and National Geographic) and books of fiction such as mysteries to books of history. Her mother has always read to her since she was a few months old, especially poetry which she greatly enjoys as well as fairy tales, adventure stories, Beverly Cleary and later Cynthia Voigt. Her mother plays recorder in an ensemble which performs irregularly. When Joan was a baby her mother sang to her and played music on the recorder as well as playing children's records for her. Joan enjoys parts of her mother's collection of classical music as well as South American music and the Peruvian flute which are her father's favorites in folk music. She is also developing an interest in Rock along with others of her age group's interests and is a gregarious person. The family goes to symphony concerts, having started with children's concerts and moved to adult evening concerts especially when there is a cello soloist. She started cello when she was in Grade 2 and has sung in the school choir.

Joan's mother believes in a combination of phonics and whole word recognition, thinking both are necessary and believing that individual children have different ways of learning so that the same approach won't work for all. Joan learned to read through being read to and began sharing the reading with her mother when she was about four years old. Her music reading has been learned with a similar experience of hearing and learning by ear first, with notes added later.

Although her school teacher was unavailable for an interview, her mother reports that Joan tends to be a dawdler at school and ends up having to do much of her work at home for homework. Her math skills have never been strong. She reads very well, particularly for events and facts, but doesn't always comprehend the deeper meanings in what she reads. She tends to be somewhat behind other children her age in emotional and social maturity, although she is mature in her sensitivity to other people, and this seems to be reflected in what she gets from her reading. Her music through cello has been her greatest enthusiasm, but although she plays and reads well, her tone lacks body and interpretive depth.

Profile of Joan's Text Reading

Fifty-seven percent of Joan's text reading miscues were high in graphic similarity to text words indicating that she was attending to and analysing the text. Only 14% of her miscues were high in sound similarity which suggests that she was not always associating the correct sound with the graphic cues analysed. However, Joan made only 16 miscues in the passages to Grade 11/12 and never reached frustration level in miscues.

Table 21

Joan: Percentages of Miscues Scored High at Instructional Level

	Text Based			Knowledge Based			
Text Reading	Graphic Similarity	Sound Similarity		Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected
Music Reading	Bowing Similarity	Pitch Similarity	Intonation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected
Text	57	14		29	29	57	30
Music	100	66	97	40	26	6	16

Only 29% of Joan's miscues were grammatically acceptable. An example of her grammatically unacceptable insertions follows. Joan read: "news of the attack on the Pearl Harbor was broadcast..." for "news of the attack on Pearl Harbor was broadcast..." This example shows that she was predicting because the insertion is grammatically acceptable with the first part of the sentence, but not with the last part .

Joan's score for semantic acceptability was similar at 29%. She read "representatives from many nations worked through the United Nations to help mechanisms for avoiding the recurrence of...) for "....... to develop mechanisms ......". The miscue in this example makes sense with the first part of the sentence but not with what followed the miscue again confirming that she was likely predicting on the basis of only sentence parts.

Joan maintained the author's meaning in 57% of her miscues, indicating that in spite of relatively low scores on use of print based and knowledge based information, over half of her miscues did not deviate from the author's meaning. Nearly a third of her miscues were corrected which suggests that she was also monitoring (Table 21).

Table 22

Joan Percentages of Unaided Recalls at Instructional Level

	Text Based			Knowledge Based			Text Error			
	A	B	C	D	E	F	G 1	G 2	Recalls Not Prompted	Inference Questions Answered Acceptably
	Text Exact	Text Specific	Text Embedded	Text Entailed	Inferential	Ex-periential	Text Erroneous	Non-		
Text	14	54	5		27				94	50
Music	44		14	22	11		9		83	70

In Joan's recalls, the combined score of A/B/C was 73% (Table 22). Since most of her recalls were text based, she was attending to the text cues, analysing, associating and synthesizing. The balance of her recalls were in the "E" category suggesting that, although she was predominantly a text-based reader, she was inferring though not using her background experience as extensively. She answered half of the inference questions acceptably.

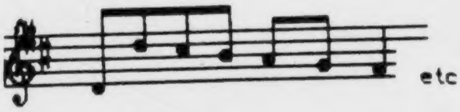
Joan produced more recalls for the narrative passage at 9/10 level than she did for the expository passages at the 8 and 11/12 levels but didn't reach frustration level for recalls until the 11/12 passage. She made no errors in her recalls (no G responses) and nearly all of her recalls were unprompted.

Profile of Joan's Music Reading

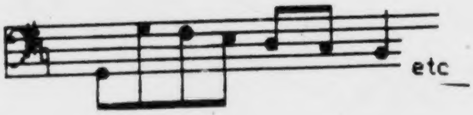
Joan's miscues were all high in bowing similarity to the score (Table 21) and 66% of her miscues were high in pitch similarity to the score. This presents a picture of a print based reader who is attending to and associating the visual cues to sound. Ninety-seven percent of her intonation on miscues was high in similarity, but the rhythmic acceptability of her miscues was not as high (40%). Rhythmic acceptability is absolutely essential for musical acceptability and her score of 26% for music acceptability reflects the rhythm errors. However, this score is somewhat misleading as it implies that her playing was not musically acceptable. This was not the case. She did not make a large number of errors in her music reading, but those errors she did make reflected her concern with accurate pitch and intonation while rhythm (and therefore music acceptability for those miscues) was not being attended to.

In another instance, Joan showed that she was using her music knowledge and experience to predict and monitor as well as using the visual cues in her reading. In Exercise #19 passage (Appendix A) which goes into the treble clef (therefore altering the pitch of the notes written on the staff by an interval of a tenth) she didn't play the right notes. However, she adjusted every note in the sequence of notes following the one she started on so that the passage was accurate in sequencing and sounded right even though she started on the wrong note, and altered the key signature so that the intervals in the sequence would be accurate. This involved very sophisticated inferring, predicting and monitoring to make the music meaningful and is not in keeping with a low score for music acceptability.

Written:



became:



The treble clef portion of the passage was a repeat of the first part in bass clef. Joan appeared to be integrating her musical knowledge and experience with her observation of the pattern of the visual cues and using this to predict what it should sound like in order to fit the rest of the passage. In fact later she said, when asked what she was thinking of when she played the passage, "I think I was thinking of......to try and make it sound like it sounded before I went into the treble clef". This revealed that she had read the visual cue (treble clef) but just hadn't interpreted the symbol correctly. This passage was coded as only one miscue as it was only the treble clef that she missed interpreting. If it had been coded as 23 miscues (the passage being 23 notes long), the percentage of musically acceptable miscues would have been far greater as , although the pitch was wrong because of the clef interpretation error, everything else was correct, including intonation, rhythm and bowing.

In the last passage which was atonal, all of Joan's errors were musically acceptable. If we combine her percentages for high with partial musical acceptability, her total score becomes 77%. Again, as in text processing, this indicates predicting on the basis of small units of text. Joan's score for maintaining the composer's intent in her miscues was 6%, indicating difficulty with integrating text based and knowledge based information.

Forty-four percent of Joan's recalls were in category "A" which confirms that she was attending to and analysing the text cues. With 14% of her recalls in "C" and 22% in "D", it appeared that she was also synthesizing and making associations. Her 11% of recalls in "F" suggest that she was elaborating and predicting. "G 1" category recalls at 9% tell us that she would occasionally get one detail wrong in recalling text information. Her recalls were mainly unprompted showing that she was organizing her comprehension and she answered most of the inference questions acceptably showing that she was integrating her musical knowledge with the graphic cues (Table 22).

Comparison of Joan's Text and Music Reading

The figures in Table 21 present a picture of Joan as a reader who relied more heavily on visual information than her background knowledge in both music and text reading, although she gave more attention to the visual cues in her reading of music than she did in her text reading, analysing the visual cues and associating them to sound more accurately in music than in text. Her music reading scores in rhythmic acceptability, though not high, showed that she predicted and was concerned more with making the music sound right than she was about making the text sound right when she was reading written language. Joan was predicting meaning on the basis of relatively small units in both music and text. She was making sense of the text and making the music acceptable to about the same extent, but was maintaining the author's meaning more in her text reading than in music. She corrected a higher percentage of miscues in her text reading than in music but was monitoring in both. It is important to note that Joan's miscues did not appear to provide an accurate picture of her text or music reading. She was in Grade 7 and reading exercises at the Grade 11/12 level and in music was playing music well beyond where most of the students of her age and level of experience were experiencing frustration and still playing it musically acceptably. Her miscues do not reflect this level of proficiency.

Joan's combined recalls in A/B/C imply a greater attention to visual cues in reading text than music (Table 22). Her combined recalls in D/E/F categories, which represent knowledge based recalls, were 27% for text and 33% for music suggesting that she was using her knowledge and experience about equally in music and text. However, all knowledge based recalls involved inferring in her text reading and most of her music recalls involved synthesis. She made no recall errors in text and the 9% she made in music were all errors of a single referent in an otherwise correct recall.

In both music and text most of Joan's recalls were unprompted, though more in text than music. She answered a higher percentage of inference questions in music than in text.

During the testing, Joan took very little time to read the passages over silently. When she was asked how she figured out words she was not sure of, Joan said she looked at it syllable by syllable and if she didn't know the meaning of it, she figured it out by reading the previous sentence and the sentence after it to try to figure it out. In recalling parts from passages read, she said that if she had difficulty she read a passage over again, but that usually she just thought about it and tried to remember without using any particular device.

Ray

Home and School Background

Ray is the youngest of three children, the only boy, whose father is a teacher and whose mother trained as a nurse but has been a full time homemaker until recently. In the father's family, everyone plays some musical instrument. His uncle is the leader of an ethnic orchestra. Ray's grandfather and grandmother "worshipped music", always telling their children that even their scales were beautiful.

Ray's mother's musical experiences were more limited. She learned to play the mandolin slightly in a little country school with a group of children who stayed after school with a teacher for instruction.

Ray had Orff training for a year when he was four years old but didn't enjoy it. He loved his mother to sing lullabies to him through his early childhood. His Dad, who plays the piano, gave him piano lessons for a year and Ray sang in the school choir in Grades 4 to 6. The mother began bass lessons with Ray when he started bass in a group with older children when he was in Grade 1. After the initial year, his father took over the supervision of his practice and attended lessons as often as he could, writing down lesson assignments and seeing that they were done. His father likes classical and light classical music and his mother prefers country and rock music.

Ray is very enthusiastic about and successful in sports, being on city wide teams in hockey and soccer. The family is actively involved in supporting all of Ray's activities. They believe that both music and sports are important and work carefully to see that one does not preclude involvement with the other.

Ray's family get the daily newspaper and used to subscribe to magazines. They found they didn't have time to read them and dropped all but the "freebies". Ray has read the usual popular authors for his age, such as Roual Dahl. He likes science fiction, but also reads all varieties of fiction . The children have had many books bought for them in their childhood, but now mostly use the library, reading ten to twelve books during each three week loan period. Now that they have a computer, they tend to have less time for reading. Ray plays chess with his Dad who says that Ray has more staying power than he has in most things. Both mother and father read to the children frequently. The children enjoyed it greatly and frequently requested favorite books that they could read-recite from hearing so often. At about age five, Ray began recognizing words and learned to read before he went to school where he went into french immersion and was taught to read in French. Ray's teacher states that he "reads in sentences" and is weakest in oral expression. She uses a whole language approach, with phonics and rules applied when needed. She doesn't see the same drive in his academic work as he has in sports where he is very achievement oriented and has great drive. She sees him as being very "macho".

Ray's mother believes that reading should be taught through phonics first. She believes that sight word recognition is also important for speed in reading, but believes that the basics must be emphasized and that word recognition will come with experience. His father can see merit in a mixture and believes that somehow, good readers will probably learn either way. In music, both parents believe in a combination of playing "by ear" and reading the symbols. They favour a combination of private and group instruction for bass, believing that the group gives individuals impetus. Their perception of Ray is that he is an excellent and fast reader. In music they are also happy with his reading. His father believes that his own reading in music is poor because he was never given more than four pieces each year and learned only those pieces rather than having many reading experiences such as Ray has in his music classes and orchestra rehearsals.

Profile of Ray's Text Reading

Ray made only nine uncorrected miscues, most of which were omissions (eg. "South East Asia and the Middle East" for "South East Asia and in the

Middle East"), substitution of function words, and some insertions (eg. "after hostilities ended" became "after the hostilities ended"). There were some other errors such as "cumulated" for "culminated" which suggested unfamiliarity with some of the words, but he did not reach frustration level in either miscues or recalls. From this we may assume that he was successfully using all the processes of attending, analysing, associating, synthesizing, inferencing and predicting. He corrected half his total miscues from which we can infer that he was also monitoring.

Table 23

Ray: Percentages of Miscues Scored High at Instructional Level

	Text Based			Knowledge Based			
Text Reading	Graphic Similarity	Sound Similarity		Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected
Music Reading	Bowing Similarity	Pitch Similarity	Inton-ation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected
Text	Only 9 miscues						49
Music	68	59	86	95	68	32	42

In his recalls, 31% were in "B" confirming that he was attending to, analysing and associating meaning with text. The rest of his recalls were in the E/F categories(69%) showing that he was also inferring and predicting on the basis of his background knowledge (Table 24). He had many more recalls in the "F" than "E" category indicating that he was not always constrained by the text in his use of knowledge. This was shown also in only 50% of the inference questions being answered acceptably. Ninety-six percent of his recalls were unprompted. It can be concluded that, as a text reader, Ray relied quite heavily on background knowledge to recall information read.

Table 24

Ray: Percentages of Unaided Recalls at Instructional Level

	Text Based			Knowledge Based			Text Error			
	A Text Exact	B Text Specific	C Text Embedded	D Text Entailed	E Inferential	F Ex-periential	G 1 Text Erroneous	G 2 Non-	Recalls Not Prompted	Inference Questions Answered Acceptably
Text		31			15	54			78	50
Music	61		2	16	19		2		53	50

Profile of Ray's Music Reading

In Ray's music reading, 68% of his miscues were high in bowing similarity, 59% of his miscues were high in pitch similarity and 86% of his miscues were high in intonation similarity to the score. This tells us that he was attending to the score, analysing visual cues and associating sound to the visual cues. In rhythmic acceptability his miscues were coded 95%, 65% of his miscues were coded high in musical acceptability and only 5% of his errors were deemed not musically acceptable at all.

Typical of Ray's concern with making the music acceptable was how he reacted to errors that he made. When he was playing one of the exercises, for example, he noticed that it didn't sound right. He stopped playing, looked it over again, and then replayed it accurately. This also illustrates that he monitored as he read music. Ray usually took time for a careful prereading of the passages that presented some technical difficulties for him, but maintained the composer's intent for only 32% of his miscues. His score compared with that for music acceptability (Table 23) suggests that he was less successful in integrating his musical knowledge with the visual cues. He corrected 42% of his total miscues which confirms that he was monitoring as he read.

In Ray's music recalls, 61% were in the "A" category which shows that he attended very closely to the visual cues, analysing and associating meaning to them. His combined C/D recalls (Table 24) were 18% which showed that he was synthesizing and making some generalizations about the score. His recalls in the "E" category show that he was also inferring on the basis of the text information and his background knowledge but he answered only half of the inference questions correctly. When he couldn't answer the interpretive question it was generally because he just hadn't noticed the detail in the music. For example, when asked about the purpose of a certain marked fingering which he had played as marked, he replied: "I didn't notice it". This suggests a picture of a reader with high automaticity. Ray had only 2% recalls in "G 1", which was a single referent error in an otherwise correct recall.

About half of Ray's music recalls were unprompted. In the music reading tests, Ray did not have a lot of detailed recalls but read accurately for the most part. His responses were perfunctory, giving the impression that he considered those details unimportant as long as he had been able to play the passage. It could also suggest a high level of automaticity in processing details.

In Exercise #20 (Appendix A) half of which was in the treble clef, a clef that was not being introduced early in the bass players' development and considered quite advanced for the bass at that time, and which he had not yet been formally taught, he just said he couldn't read it. When it was suggested to him that he make a "guess" and try it, he would not. He wasn't being uncooperative, he just didn't wish to play it until it was taught and he could do it properly. It was difficult to know how to code the exercise for miscues, so it was not included in the coding at all.

In discussing his reading, Ray said that if he found things difficult, he would think back to the beginning of the song and to what he did. He said he would think through each action and what he saw in his mind.

Comparison of Ray's text and music reading

Ray's music miscues and lack of miscues in his text reading showed that he was using both background knowledge and visual cues effectively as he read: attending, analysing, associating, synthesizing, inferring and predicting. He corrected nearly half of his miscues in both music and text from which we may infer that he was also monitoring. His only low score on music was on composer's intent, but for that category it was a relatively high score.

In his recalls, Ray had considerably more in the A/B/C (text based reader) categories in music at 63% compared with his text recalls at 31%. 35% of Ray's recalls in music were in the D/E/F (knowledge based) category compared with 69% of his text recalls which suggested that he was synthesizing more in music and elaborating more in text , relying more heavily on knowledge in text reading than music. More of his recalls were unprompted in his text reading (Table 24) but only half were unprompted on the music task. This may have been partly due to his interpretation of the task. He gave the impression that he thought it a rather silly task, not a musically meaningful activity. Indeed, the attention of students at Ray's level of development is drawn to the clefs, key signature, time signature and other markings in the music only when they are not observed. It is expected that students silently and automatically attend to these details so they can play accurately so it is not something that is generally discussed unless it has been a problem.

According to Ray's recalls his text reading seems to rely more on his background and his music reading on the visual cues. However, because of his attitude to recalls, the miscues probably give a more accurate indicating of his processing. Ray's reading in both music and text showed evidence of effective use of all of the processes in both. He was reading as successfully in music as he was in text.

Ray has spent as much time in formal training learning to read music as he has learning to read text in school, having begun his musical studies on the bass in Grade 1. His family have supported his endeavors and, although he is very active and successful in sports, he has never been allowed to restrict himself to that particular aspect of his training. His school records show him to have above average intelligence and high scores in reading text.

Comparison of Students' Music and Text Reading

In order to make comparisons across students, I put all the information about miscues and recalls from Tables 9 - 24 on a single table (Table 25). The information on this table was divided into visual information and knowledge

Table 25

Summary of Percentages of Miscues and Unaided Recalls in Music and Text Reading Tests at Instructional Level

		Percentages of Miscues Scored High							Percentages of Unaided Recalls									
		Text Based			Knowledge Based				Text Based			Knowledge Based			Text Error			
Text Reading		Graphic Similarity	Sound Similarity		Grammatical Acceptability	Semantic Acceptability	Author's Meaning	Miscues Corrected	A Text Exact	B Text Specific	C Text Embedded	D Text Entailed	E Inferential	F Experiential	G 1 Text Erroneous Specific	G 2 Non-Specific	Recalls Not Prompted	Inference Questions Answered Acceptably
Music Reading		Bowing Similarity	Pitch Similarity	Intonation	Rhythmic Acceptability	Musical Acceptability	Composer's Intent	Miscues Corrected										
Ivan	Text	35	31		65	65	69	31		25	25	19	12	16	3		76	69
	Music	94	81	75	38	13	13	22	14	12	14	31	12	6	6	4	69	38
Duke	Text	56	50		75	75	94	45		47	11	16	11	15			73	100
	Music	100	69	100	6	6	0	32	48	14	5	24			9		70	20
Pat	Text	33	0		83	83	50	28		20	20		25	30	5		100	100
	Music	78	45	45	11	0	0	27	45		10	20				25	58	0
Rebecca	Text	Only 6 miscues						38	11	39			29	21			90	0
	Music	100	83	58	58	0	42	9	41	15	9	20	6	6		3	70	0
Nicholas	Text	Only 4 miscues						20	22	37	13	8	13	7			87	100
	Music	100	77	32	50	54	46	26	40	1	17	12	17	1	11		79	100
Gillian	Text	Only 3 miscues						71	10	21	4	15	23	23	4		79	67
	Music	64	66	55	82	41	36	47	27	8	22	14	18	6	5		96	75
Joan	Text	57	14		29	29	57	30	14	54	5		27				94	50
	Music	100	66	97	40	26	6	16	44		14	22	11		9		83	70
Ray	Text	Only 9 miscues						49		31			15	54			76	50
	Music	68	59	86	95	68	32	42	61		2	16	19		2		53	50

information. Graphic and sound similarity was taken to represent the processing of visual knowledge in text reading and bowing and pitch were taken to reflect the processing of visual cues in music. If the average of each of the student's miscues in Graphic/Sound Similarity for text and Bowing/Pitch Similarity for music was 50% or higher, it was considered to indicate adequate (+) use of visual cues. If the average was less than 50%, use of visual cues was considered inadequate (-). If the average of the scores of miscues coded in Grammatical/Semantic acceptability was 50% or more , this was taken to indicate adequate use of knowledge in text reading (+). If the average of the scores of or miscues coded in the Rhythm //Music Acceptability categories was 50% or more, this was taken to indicate adequate use of knowledge in music reading (+). If the average score was less than 50% in each of these groupings, it was interpreted to indicate inadequate use of background knowledge (-) . Students who made too few uncorrected miscues to be coded were deemed to have been using both visual cues and background knowledge adequately (all "+") since they had identified nearly all the words in passages to the grade 12 level accurately.

Because all of the recalls come to only 100%, it was decided that if 40% or more were in the " A/B/C" categories, then it was considered their use of visual information was adequate (+) and if less than 40%, inadequate (-). If 40% or more of the recalls were in the "D/E/F" categories it was considered that their use of background knowledge was adequate (+) or if less than 40% recalls, inadequate (-). Table 26 presents this information. An examination of this table

Table 26

Use of Visual and Knowledge Based Information in Music and Text Reading

		Visual Cues		Knowledge	
		Miscues * Graphic/ Sound Sim. Bowing/Pitch/ Inton.	Recall ** A B C	Miscues* Grammatical/ Semantic Accept. Musical Accept./ Rhythm	Recall** D E F
Ivan	Text	-	+	+	+
	Music	+	+	-	+
Duke	Text	+	+	+	+
	Music	+	+	-	-
Pat	Text	-	+	+	+
	Music	+	+	-	-
Rebecca	Text	+	+	+	+
	Music	+	+	-	-
Nicholas	Text	+	+	+	-
	Music	+	+	+	-
Gillian	Text	+	-	+	+
	Music	+	+	+	-
Joan	Text	+	+	-	-
	Music	+	+	-	-
Ray	Text	+	-	+	+
	Music	+	+	+	-

* 50% or more considered adequate use

** 40% or more considered adequate

(+) means adequate use (-) means inadequate makes it easier to see relationships in the patterns of students' processing.

Ivan

In text, Ivan's miscues showed adequate use of knowledge information but they did not show adequate use of visual information. His recalls, however, showed adequate use of both visual and background information. It would appear to be an inconsistency that he made inadequate use of visual cues as he was reading and yet was able to recall considerable text information after he finished reading. This may reflect his rich store of background knowledge. Ivan is part of an adult community in his home, has a high average intelligence and knows a lot. He may have been able to overcome any inconsistencies that might have occurred during reading by using this stored knowledge as he recalled information. It may also be that while he was reading, although he was not always correcting overtly, he was doing some covert monitoring so that he was able to recall text accurately. In spite of the discrepancy between miscue and recall data in text reading, overall Ivan was a reader who was able to make effective use of knowledge and visual information and this was especially evident in his recalls, although during the actual act of reading itself, he didn't always demonstrate that on his miscues.

On the music reading during the actual playing itself, Ivan was able to use the visual information but was not as effective in using his background knowledge. On recalls he was able, as in text reading, to demonstrate adequate use of both visual cues and background knowledge. The discrepancies between miscues and recalls for Ivan occurred on both text and music reading. During the playing of music and the reading of text, he was having some difficulty with using both visual and knowledge sources of information, but on recalls he had enough knowledge to compensate for this difficulty. Although Ivan's profile was not similar generally to any of the other students, his profile for visual cues was similar to Pat's.

Pat:

Pat's music reading showed a clear pattern. In music, both miscue and recall data showed adequate use of visual information but inadequate use of background knowledge. However, her text reading did not present the same pattern. Like Ivan, while she was reading she didn't seem to be processing the visual information quite as carefully. This appeared to be a real inconsistency for her because she seemed to be able to integrate information sources (as indicated by both her answers to inference questions and the percentage of miscues which were constrained by the author's meaning). This may suggest that some covert monitoring was going on. There was a clear difference between her music reading and her text reading in use of background knowledge. In music reading she was not making adequate use of her knowledge and in her text reading she was. The inconsistency in her use of visual information in her text reading reflected comments by Pat's parents and teachers that she was an inconsistent performer at home and at school. Her reading results in the tests given for this study showed a higher level of competency than those she was given at school, also, but her mother had told me that she often refused to take the reading tests at school or was not cooperative when taking them. Pat's school records, however, did show reading scores acceptable for her grade level and scores of average intelligence.

Pat's extensive background with language and literature was evident in her text reading, but although she had been involved with music from a very early age with more experience in music reading than Ivan and had a supportive family, this was not reflected in her music processing. Her music reading showed a clear pattern, in both her miscues and recalls, of attending, analysing and associating the visual cues, but not using her background knowledge to synthesize, infer, predict or monitor.

Duke and Rebecca

Rebecca and Duke have exactly the same profile and their profiles were very clear. They were readers who thought it appropriate to use knowledge in text reading, but not in music.

On the text reading, Duke made adequate use of visual and knowledge information on both recall and miscue data even though his teachers at school felt he was better at decoding. For his music reading , he was making effective use of the visual information but he was not making use of background information. This pattern showed up on both miscues and recall. In light of his extensive background in performance with his family and the musical climate in which he lived at home, it was surprising to me that he was not using his background knowledge.

Rebecca's family, though not as involved in music, had provided listening experiences for her in terms of concert attendance and support for her endeavors. Still, she was not engaging her background knowledge for reading music as she was in her reading of text. An interesting difference between Rebecca and Duke was that, although their reading profiles were similar, Duke showed some success in integrating his knowledge and visual cues as reflected in his answers to inference questions whereas Rebecca did not. This was also a surprise in light of Rebecca's rich background in literature, her higher than average intelligence and her solid background of music training at school as well as on the bass.

Nicholas

Nicholas had a rich family background in literature and a predominance of adult company, conversation and experiences throughout his life. Nicholas was using background knowledge while reading more in music than many of the readers in the study although he didn't have more music experience. However, his much higher than average intelligence (see Table 1) may have enabled him to speed up his generalization of reading skills to the reading of music symbols. In his recalls in both reading and music he showed an inadequate use of background knowledge, but it may be that his interpretation of the task was that I just wanted a verbatim return of the text and score and that it was not appropriate to interject anything from his background knowledge. The minuses for recall on both text and music are probably not so much an indication of his processing as they are an indication of his interpretation of the task. If I had asked him to tell me everything he remembered from the passages of text and music plus what he thought about it, how it made him feel and what it reminded him of, I may have received more of his background knowledge. His profiles were consistent for music and text reading.

Gillian and Ray

Gillian's profile was the same as that of Ray. They demonstrated adequate use of print cues and knowledge on miscues but there was inconsistency between the text and music reading on the recall data. For Ray, it could be that his attitude affected his responses since he thought the recall task was silly. Both were making adequate use of visual information except on the text recall and both were making adequate use of knowledge based information on everything except the music recall. It appeared that when they provided the music recall they didn't think their music knowledge was important, although when they gave their text recall they relied heavily on their background knowledge. In the recall situation they were operating quite differently on the two tasks, perhaps reflecting a different interpretation of what was appropriate.

Both Gillian and Ray's families have given them support and encouragement in both language and musical activities from early childhood. They have above average intelligence and have always achieved high scores on their school reading tests. Their rich background and long history of involvement with music reading similar to their reading of text in school is reflected in their reading profiles.

Joan

Joan was the only reader in the study who made use of visual, text based information but not knowledge. In this she was consistent for both text and music and on both miscues and recalls. She was reading difficult material (in Grade 7 she was able to adequately read material to the Grade 10 level) so was not a poor reader. She didn't make a large number of miscues, over half of her miscues were constrained by text and she was able to answer several inference questions acceptably in both music and text. Her mother had reported during the interview that Joan read very well for facts and events but didn't always comprehend the deeper meanings. This was confirmed in her profile of not using background knowledge, although her answers to inference questions indicate that she relied on this knowledge to some extent.

Duke, Pat and Rebecca were similar to Joan on music reading. They all used visual cues but not their knowledge. However, Joan was the only one who did the same on text reading. Duke, Pat and Rebecca were able to make use of their knowledge in their text reading but not in music.

Comparison of Text and Music Reading Across Students

Miscues

The general trend in the music and text reading of the students studied appeared to be that their miscues were more text based in music (Table 25). Students attended to and analysed the music more carefully than they did the text. There could be several reasons for this and other similarities and differences between text and music reading.

Coding. There might have been hidden differences in the coding of music and text reading miscues. It might have been easier to get a high score in the music than in the text in the visual cues categories so that it did not reflect a true difference. In the category alignment of Graphic similarity/Bowing Similarity, it was assumed that the readers were attending to the key signature, clef and time signature if they played any of the music correctly as attention to these visual cues is essential to making sense of the rest of the music. Bowing is one of the overt ways in which attention to graphic cues can be specifically observed.

Coding might also have been a factor in finding that in the Author's Intent/Composer's Intent categories, the Author's Intent score was always higher. The coding for Composer's Intent was stringent; that is, the reader had to play what was written without substitutions or rearrangements of any kind. The coding may have been too stringent but it may also reflect a difference between text and music reading. This difference is that in reading a student may substitute a word or group of words with the same meaning and still maintain the author's intent whereas composers would not feel that their intent had been maintained should notes of different pitches or rhythms be substituted for that which they have written.

Differences in the tasks. In aligning music and text reading, and looking at the scores that students achieved, I began to think more carefully about what the task entailed, wondering if there is something inherently different in music reading from text reading that requires closer adherence to the notes in the music score. Do pitch and rhythm require closer attention to print? Is it more crucial to know the "grammar of music" than to know the grammar of language to read? Rhythm requires very close attention to print, and all the information is on the page if the reader learns to use it, but it requires a particularly high level of association and synthesis of sounds across several symbols. There must be, in addition, a feeling of "rightness", a knowledge of the "grammar" without which music readers don't seem to be able to make musical sense.

Unlike piano, where pitch is fixed, on a string instrument it is variable and it is possible for a student to play the right pitch but not play it absolutely in tune. Whether it is learned or innate, a student must have this knowledge or feeling of "rightness" about the pitch of a note to achieve music acceptability. Highly different scores in pitch and rhythm for most of the students in the study (Table 25) lead to the question of whether or not there is more to associate in music than in text.

One similarity between music and text reading was reflected in finding that students made corrections in both. About half of the scores were quite a bit higher in text reading, but the rest were about the same. One student's percentage of corrections was higher for music than text.

Proficiency. Most of us have known language since birth and it is part of us. Reading follows this development. For many students, music reading is superimposed. Looking at Chall's stages of reading (1984, p. 15), there were probably great differences in the stages of reading which the students in this study reached in music as compared with text. In music, some students may have still been at stage one, that of learning to associate the visual cues with the sound and others may have been at stage two, that of confirming, and getting experience, with only two being at stage three where they had achieved sufficient automaticity to be independent readers. In fact, all of the students used were quite proficient with text, and most were at a lower stage of development in music. Therefore, they were not operating in the same way. The exceptions to this were Gillian and Ray who had been involved with both music and text reading for the same number of years and seemed to be less print bound with more balance between the scores for visual and knowledge information use than the other students with less experience. They seemed to be using the same strategies for both music and text reading. This was true, to a somewhat lesser extent, for Nicholas as well.

Difference in attitude to the task. In music, the proficiency level was generally lower than in text. The students had developed more facility with print reading than music reading so it may be that they thought that music reading was more difficult (a different expectation) and so attended more carefully to the print in music than in text. This would lead to higher scores in processing visual information.

.Recalls

Difference in task. In the recalls in music, there were a greater number of recalls in categories A than B when compared with text recalls. As with miscues, the results on recalls indicated a closer attention to, and analysis of, the visual cues in music than in text reading. This was generally true of all the students in the study and may be a reflection of what is necessary to notice in music reading, i.e. clef, key signature and time signature. All of these must be attended to, analysed and associated before a passage can even be attempted, as well as played acceptably. Nothing that follows in the music makes any sense if these are not attended to, analysed and associated.

There were many more "D" responses in music, and fewer E/F recalls. The D recalls represent a high level of synthesizing and, I think, reflects what must happen in successful music reading. The readers are using their knowledge, but the task calls for a different type of expression, that of high level synthesizing rather than talking about what one infers or predicts in music. The recall task may not be appropriate for music or it may be that a different way of introducing the task needs to be set so that students draw on their background knowledge for their recalls.

Task interpretation. It may be that there were more recalls in the "A" category because generally speaking one isn't asked to talk about music just read, and the interpretation of the student may have been that I was asking for an announcement of all the markings on the page. One student even told me how many lines of music were written on the page, and how many measures each line had. It is essential that the reader attends to and analyses what the key and time signature are in order to make sense of the notes following, but it is not essential to remember other details about it as this reader was attempting to relate. Music is not usually talked about or paraphrased for these details although it is essential to observe them. In fact, music students are usually only required to talk about these details if they have not being observed.

Difference in proficiency. There weren't many errors in the recalls, but there were more in music than in text reading. This likely has to do with the level of proficiency of the students. The automaticity acquired through experience with reading is important in both text and music reading.

Chapter 5

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

This chapter provides a summary of the study and the major findings and conclusions. It includes implications for the theory of processes used in reading particularly with respect to music and the implications of the findings for the practice of teaching music reading, particularly for students learning to play stringed instruments. Suggestions for research suggested by this study are also included. Thoughts on the teaching and training of teachers which were suggested to me by this study are included at the end of the chapter.

Summary

Beginning with the assumption that reading is an important skill to be acquired so that our experience with music and language may be extended beyond the oral experience, the purpose of this study was to explore how students read both text and music, to make comparisons, and to look for parallels and differences.

To take advantage of the extensive research completed in the field of text reading, the purpose of the study was accomplished by first adopting a text reading model (Fagan, 1984), a set of established text reading tests (Bader, 1983) and a system of coding and analysing of data in terms of text reading processes (Bader, 1983, Fagan, 1984, Malicky, 1987). Then, based on the text reading materials, I devised a set of music reading passages and set up a coding and analyses system based on that used for text reading. Interviews with parents and school music and language teachers were held to determine the climate of the home and school backgrounds in which the students had been learning and to determine the strength and breadth of their language and music experiences to see if their background appeared to have a bearing on their processing. The school records were examined to discover the reading history and tested intelligence of each student.

After a pilot study of the music exercises, eight students were chosen for the study, their only similarity being that they were all receiving music instruction in string classes that I was teaching. The reading and music tests were administered to each student individually and took about three hours for each student to complete. Their performance on the tests was audiotaped, their miscues were recorded on a separate copy of the test for each student and their comments and reactions to the tests were noted. The audiorecording was transcribed and all recalls and miscues were coded according to the categories and procedures set. Following the assumption that we can learn more from what students do when they are successful, miscues and recalls produced by students at instructional level and miscues coded as being high in similarity to the written text and music were chosen to interpret each student's processing. These scores were all used to compare students with one another and to compare the tasks of music and reading.

Major Findings and Conclusions

The important difference between music reading on a string instrument and text reading is the need, in reading music, for coordination in the mechanical manipulation of the instrument. The consequence of this difference could be investigated in a future study.

Generally students had different profiles for music and text reading. Only two (Nicholas and Joan) had similar profiles suggesting that they engaged similar processes when reading music and text. For the remainder of the students, there were both similarities and differences in how they read the two mediums.

Similarities were more evident on the miscue than recall data indicating that while engaged in the act of reading itself, similar processes were often used for music and text reading. It may be that the miscue task is more appropriate for examining processes engaged in music reading than is the recall task.

Combining data across miscue and recall analysis, the following similarities and differences were apparent in music and text reading. All of the students processed visual information adequately when playing music whereas only four of them made adequate use of visual cues as interpreted from both miscue and recall data when they were reading text. This suggests that a difference between text reading and music reading is that you don't have to attend to, analyse and make associations to visual cues as extensively in text if you have lots of knowledge but you seem to need to in music. It may also reflect the stage of development these students were at. Looking at use of knowledge we see that all, except Joan, made adequate use of their knowledge to predict as they read text and, except for Joan and Nicholas, to synthesize, infer and elaborate on what they had read. This is expected of good readers. All of these students were bright and knowledgeable. However, on music five of the students did not make effective use of their knowledge to predict as they were playing nor did they make sure that what they played sounded right and was musically acceptable. Only three were shown to effectively use their background knowledge in music and they were the students who had the most experience with music. This could indicate that my criteria for judging were too stringent in music reading or that categories for music and text reading were not aligned correctly, but it likely also reflects the stage of development of these students. Only one student, Nicholas, didn't see the recall task as one that involved his use of knowledge on either text or music reading. Most of the students did think that it was appropriate to use background knowledge when recalling text but appeared not to think it was appropriate to use knowledge on music recalls.

While most of the students were able to make adequate use of their knowledge to predict as they read text, only those who had a long background of reading equal to text (Ray and Gillian) and the student who had especially high intelligence (Nicholas) made the same adequate use of their knowledge to make predictions in music as in text. Gillian and Ray's scores suggest that these results had to do with the stage of reading which they had reached. It may be that the others were still " glued to print" and had not reached the stage of automaticity necessary to free themselves to use their background knowledge.

Implications of the Study

Implications for Theory

A number of string pedagogues have devised string methods for teachers to follow. In strings, many books have been written about the philosophy underlining the "mother tongue" approach of Dr. Suzuki. The reading aspect has not generally been examined carefully by this approach and not considered by many of the others. The Interactive Processes Model of reading used as a basis for this study appears to me to provide a possible basis for developing a model of reading for music because, while text and music reading are not identical processes, there appear to be many similarities. The following generalizations which have been developed on the basis of process models of text reading seem to be relevant to music reading as well:

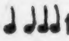
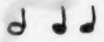
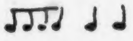
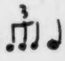
a. Building background knowledge and schema is important for both text and music reading.

b. Reading experiences are important before the introduction of theory, notation rules or phonics.

c. Time is needed for continuous and gradual growth in reading text and music.

Implications for Practice

Some not necessarily new ideas on how to improve the teaching of music reading, and particularly mine, have come from this study. They include:

1. Most of the students in this study did not have sufficient background knowledge of music to allow them to predict and monitor as they read, patricularly rhythm. This suggests that they were not sufficiently familiar with nor had sufficient experience with rhythm. More experiences with rhythm, with and without melody through clapping, dancing, singing or any experience that allows them to participate in rhythm without the complications of the technique of the instrument should precede and be included with the study of the instrument to give them a "vocabulary" of rhythm to use when they attempt to read the markings in the music. The use of children's names to make the "exercises" personal and meaningful may be devised, starting simply with, for example,  for Janice Elster, adding  for John Lawrence, for Charles Shaw and getting more intricate with  for Alexander Gilchrist and even  for Melene Smith. Each student's name and rhythm can be written out together with the music symbols that represent them so that the students can begin to associate the visual cue to the audial experience. These rhythms can be played on the open strings on their instruments.

Students' background knowledge could be extended in other areas of music as well as rhythm. For example, teachers can incorporate active listening into their lessons, as well by playing the songs the students will be playing through a variety of mediums: on the piano, bass or cello or whatever instrument the student is studying, on a recording, singing or whatever method of performance seems to be appropriate at the time. Other music of similar style could also be played for them. This should help to enlarge their background knowledge so they will be able to rely on it for predicting and monitoring.

2. Through this study I became aware of Jeanne Chall's stages of reading (1983). As I examined the results of students' reading, I could see that students were at different stages of development in their reading of music than they were in their reading of text. I was expecting them to reach Stage 3 without being sure that they had achieved the earlier stages. They need to be taught at the stage they are at, whatever their age or whatever our expectation of where they ought to be in their development.

3. A recently published book on Dr. Bornoff details the philosophies which led to the development of his approach particularly devised for use with children learning to play a stringed instrument in groups in schools (Howell & Howell, 1989). His theories on the teaching of reading are outlined in some detail (Howell & Howell, 1989 , 5-94). The philosophy and recommendations are excellent, but the books used in this approach have so many notes on each

page and the notes are so small, that young children (though their eyes are directed to the notes on the page) are overwhelmed with them and tend not to engage their minds as they look at the "sea of notes". Although there are directions on "focussing of every eye" (ibid, p. 96) , it is very like trying to teach a youngster in Grade 1 to read text by using the Encylopedia Brittanica. As I looked at the story books the successful text readers in this study had started with, I saw that to accommodate young eyes there were few words on each page with big print and good stories. These students who read text a lot had access to many books and were encouraged to read as much as they wanted. Students of music can be provided with lots of music, beginning with a similar format of big notes, one tune on each page, good graphics and good tunes. The books can be introduced after ensuring that the students have a "vocabulary" of tunes and rhythms in their background knowledge on which to draw.

4. In order to help students use the skills they have already acquired in reading text, teachers can draw their attention to these already effective processes they use in their text reading and show them how to relate these to music reading so they can generalize their skills and transfer their use to music. Students who already have a good background knowledge of music but are not incorporating this knowledge into their reading can be shown how to use the skills they already have from their other music experiences and encouraged to integrate and generalize their knowledge.

5. For students who are having great difficulty learning to read music, I would suggest doing testing similar to that which I used in this study and doing a miscue analysis for the students to see how they are processing. This may help to suggest work which can be done to develop those processes not being used effectively. The recall analysis did not appear to me to be as useful a diagnostic tool, but it may still help the teacher to see if students are attending to the visual cues, a necessary prerequisite to successfully analysing the rest of the musical symbols.

Recommendations for Further Research

Several studies are suggested by the work done for this thesis.

1. This study could be redone and changed in the following ways:

a. Use younger students so more miscues are available for analysis, or use a larger number of text reading tasks for students reading at higher levels to provide more miscues from more advanced readers for analysis.

b. Alter the instructions for recalls in music. Rather than just asking the students to tell everything they remember about a passage of music they have just played, ask them to tell also what it reminded them of and how it made them feel. This should help them to realize that their background knowledge of music is of some importance and encourage them to share this knowledge in their recalls.

c. Revise and add to the music exercises to provide some simpler exercises. Suggested changes include: addition of exercises involving open strings with no rhythmic difficulty; addition of dynamic and interpretive markings, and slower introduction of slurs, rests, and rhythmic variations. If with these additions the tests take too long, they may need to be administered in more than one sitting.

d. Counterbalance the order of administration of music exercise and text passages to avoid a possible order effect.

2. All of the students in this study have supportive homes with families that encourage their involvement with music and literature. A study of the results of students' reading of music in homes where literature is encouraged but music is not would be interesting but difficult as it has been my observation that without that kind of encouraging emotional atmosphere children generally don't last long on a string instrument. This suggests a further study on emotional home support and string class drop out rate.

3. It would be interesting to compare the music reading processes of students who have grown up with the Suzuki "mother tongue" approach from birth compared with students who have received the traditional approach of introduction of reading with the instrument. This could involve two studies at the following points in development:

a. the beginning to read stage to examine how children approach the task of beginning to read and what processes they utilize; and

b. after students have been reading music for a year or more.

4. A study could test students separately on their reading of rhythms, and on

their reading of pitch differences without rhythmic variations followed by a test with the two (pitch and rhythmic variations) together. This would enable a comparison of the process students use during each exercise and determine which aspect of reading (pitch or rhythm) causes most difficulty.

5. A study, in which students could express their music reading by singing the exercises without having the mechanical manipulation of the instrument involved, followed by a playing of the exercises, could be done to investigate the effect of coordination needs of a string instrument on the reading of music.

Reflections

This study has lead me to a strong belief that all teachers, no matter what subject they teach, should be required in their training to take at least one course in reading. It has also led me to believe that students who are graduating from faculties of music and music schools, expecting to teach music students privately, would also benefit greatly from at least one reading course which included a study of the stages of learning.

I learned through this study that in my teaching I was not giving enough attention to ways in which I could improve the rhythmic understanding of my students because students who I thought had no skills in reading were really suffering only from rhythmic difficulties and were performing very well in the other aspects. My judgement had been clouded by the rhythmic distortions. The study revealed for me the importance of careful analyses of errors.

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APPENDIX A

Music Reading Exercises for Cello and Bass and Questions for Recall

The Bass and Cello music exercises have been reduced in size for inclusion in this appendix

Reading Exercises - Violoncello

PROCESSES USED IN READING

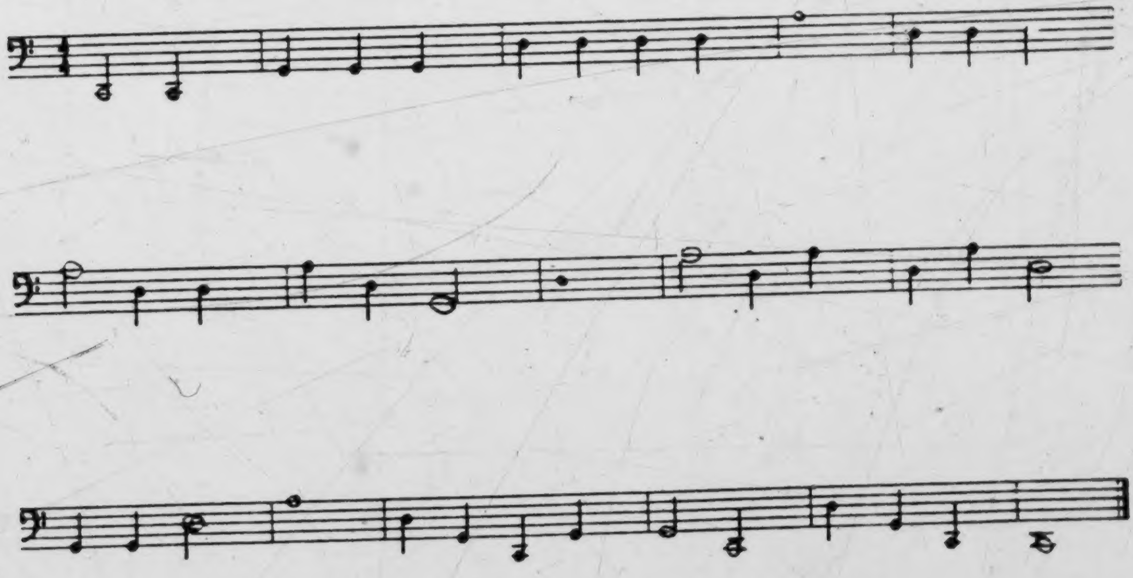
Exercises For Use in Observing Processing

Patricia Brine
March, 1986

Advice, Direction, Corrections and
Editing -Professor Claude Kenneson,
cellist, Department of Music, University
of Alberta.

Moderato **Exercise 1**

♩ = 50



Reading Exercises - String Bass

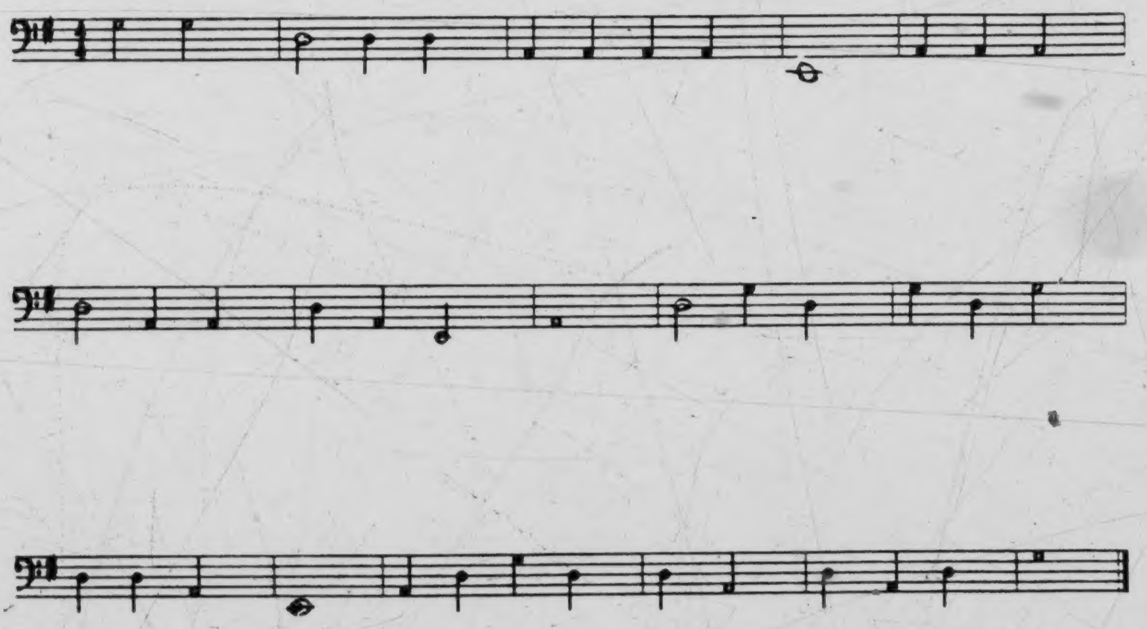
PROCESSES USED IN READING

Exercises For Use in Observing Processing

Patricia Brine
March 1986

Advice, Direction, Corrections and
Editing - Professor Claude Kenneson,
cellist, Department of Music, University
of Alberta

Exercise 1. ♩=60 Moderato



Music Exercise # 1

Unprompted memories :

____Key signature (Cello -no sharps or flats, key of C) (Bass - F#, key of G)
____Time signature (4/4 time)
____Types of notes (half notes, quarter notes, whole notes)
____Markings (Cello - moderato and quarter note = 50; Bass - moderato)
____All open strings

Comprehension questions:

____What is the key signature ? (Cello - no sharps or flats, key of C) (Bass - F#, key of G)
____What is the time signature? (4/4 or common time)
____What value of notes did you play? (half notes, quarter, whole)
____Any markings on the music? (moderato, quarter note = 50)
____What special feature ? (all open strings)

Interpretive question:

What sort of pattern did the notes follow in this exercise? (combination of two quarter notes and a half).

Acceptable answer: Yes ______ No_____

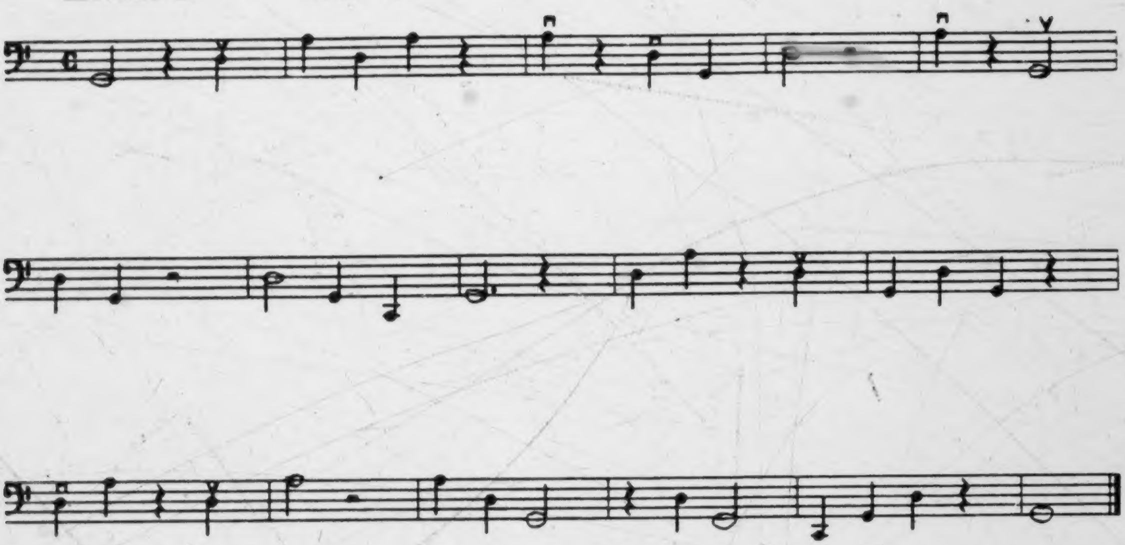
Instructional Level Guide:

3 or fewer reading errors

3 or more memories

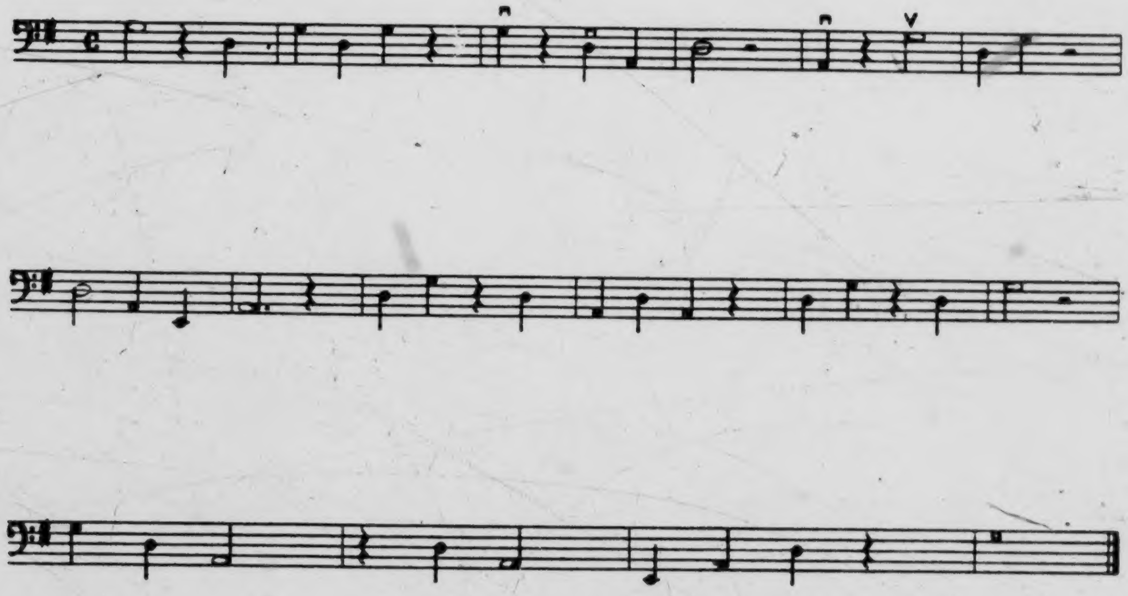
Reading Exercises - Violoncello

Exercise 2. **Andante**



Reading Exercises - String Bass

Exercise 2. Andante



Music Exercise #2

Unprompted memories:

____Key signature (Cello - key of C, no sharps or flats) (Bass - key of G, F#)
____Time signature (common time or 4/4 time)
____Types of notes (quarter notes, dotted half, half, whole)
____Rests (quarter, half)
____What markings (andante)
____Bow markings (lift bow during the rests and/or up and down bow marks)
____Open strings
____Similar bow patterns

Comprehension questions:

____What is the key signature? (Key of C, no sharps/flats) (Bass - F#, key of G)
____What is the time signature? (Common time or 4/4 time)
____What markings were at the beginning of the piece? (Andante)
____Any special bowings? (lift bow during rests)
____What value of notes did you play? (half, quarter, whole, dotted half)
____Were there any rests in the music? (yes)
____What value? (quarter, half)
____Special feature? (all open strings)
____Were there any special patterns in the music (similar bowing patterns)

Interpretive Question:

Why do you suppose the down bow is marked for the first and third beats of one of the measures but not for all?

Acceptable answer: Yes____ No____

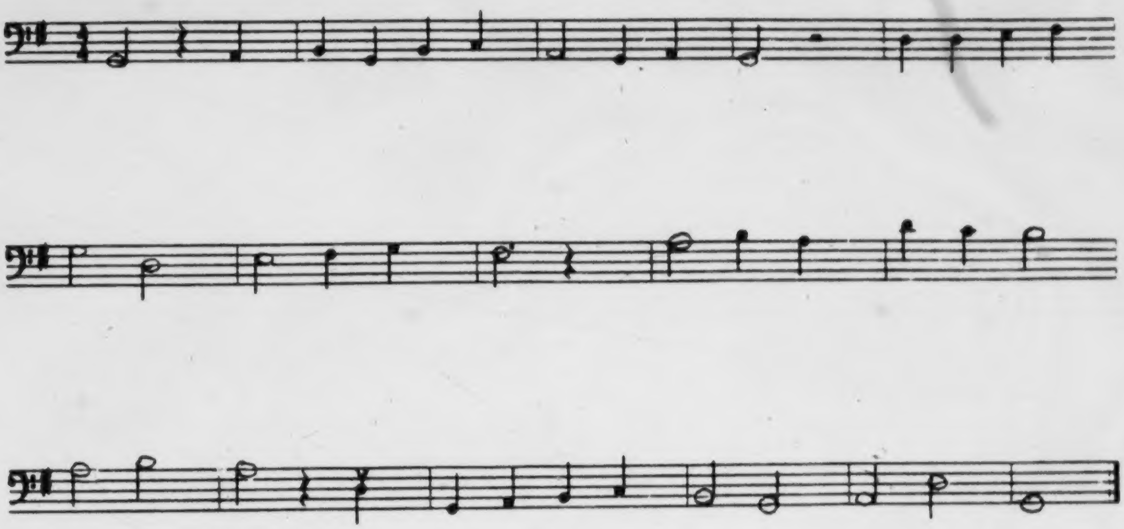
Instructional Level Guide

3 or fewer reading errors

4 or more memories

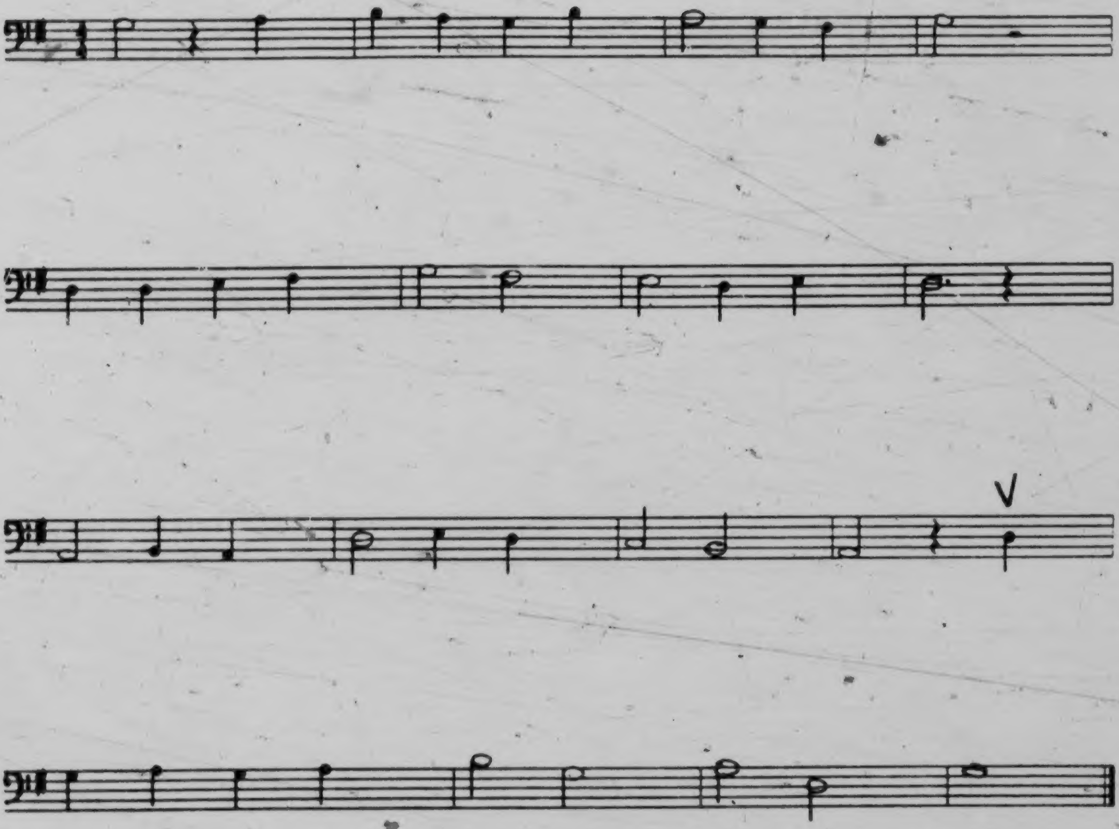
Reading Exercises - Violoncello

Exercise 3 **Adagio**



Reading Exercises - String Bass

Exercise 3 **Adagio**



Music Exercise #3

Unprompted memories:

____Key signature (F#, 1 sharp, key of G)
____Time signature (4/4 time)
____Rests (quarter and half)
____Value of notes (quarter, half, whole, dotted half)
____Special markings (Adagio)
____Fingerings all in one position (first)
____First use of dotted (or 3 beat) note

Comprehension questions:

____What is the key signature? (F#, 1 sharp, key of G)
____What is the time signature? (4/4 time)
____What value of notes did you play? (quarter, half, whole, dotted half)
____What value of rests were in the piece? (quarter, half)
____What style markings are in the music? (adagio)

Interpretive question:

Why was an up bow marked for the fourth beat of one of the measures? (cello only)

Acceptable answer: Yes____ No____

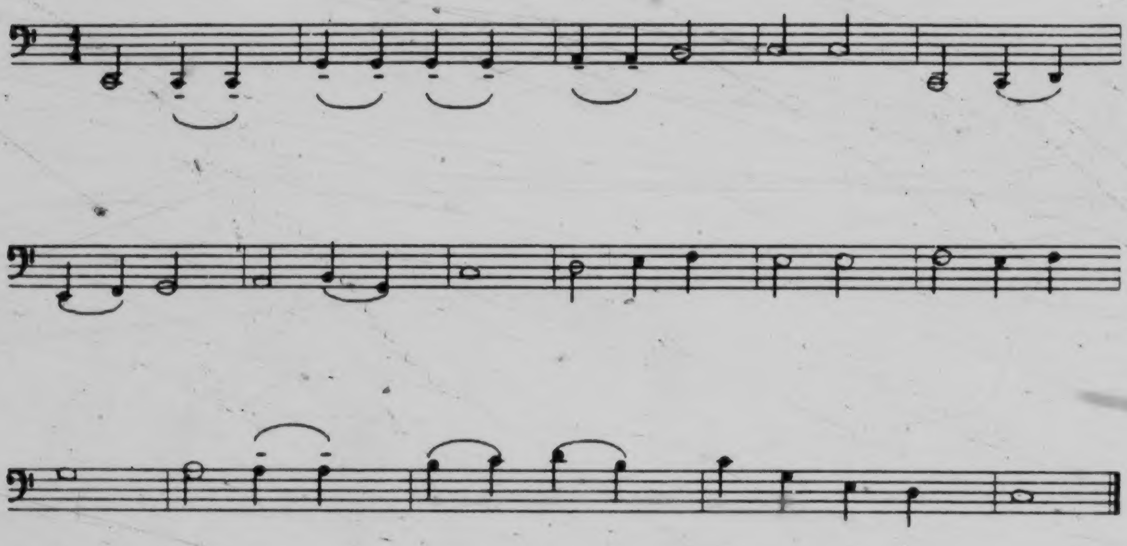
Instructional Level Guide

5 or fewer reading errors

3 or more memories

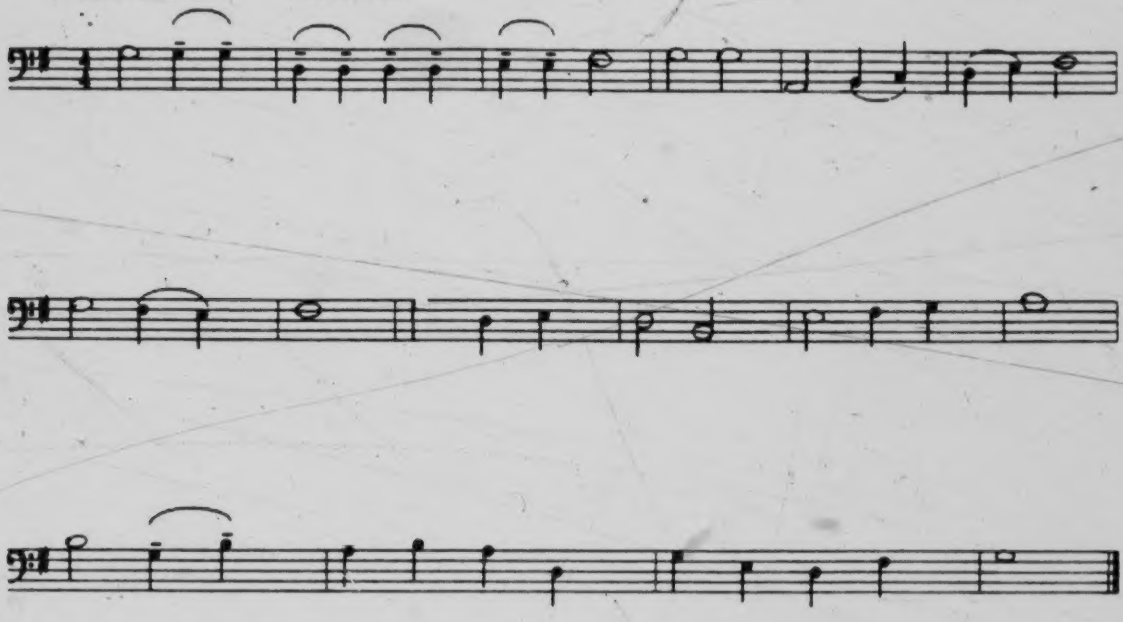
Reading Exercises - Violoncello

Exercise 4 **Moderato**



Reading Exercises - String Bass

Exercise 4 **Moderato**



Music Exercise # 4

Unprompted memories:

____Key signature (Cello - no sharps or flats; key of C) (Bass - F#, key of G)
____Time signature (4/4 time or common time)
____Half, whole, quarter notes
____Moderato
____no rests
____Position - all in first
____Portato bow
____Slurred bows
____Mostly open strings

Comprehension questions:

____What is the key signature?(Cello - no sharps/flats; key of C) (Bass - F#, key of G)
____What is the time signature? (4/4 or common time)
____Were there any rests in the piece? (No)
____What note values did you play? (half, quarter, whole)
____What bowing is asked for when a small line is underneath or over some notes combined with the curved line above or below them? (portato bow - or explanation of portato bow)
____What positions were you required to play in (first)
____What special style marking in the music? (Moderato)
____Slurred bowing? (yes)

Interpretive Question:

What technical exercise does this resemble?

Acceptable answer: Yes____ No____

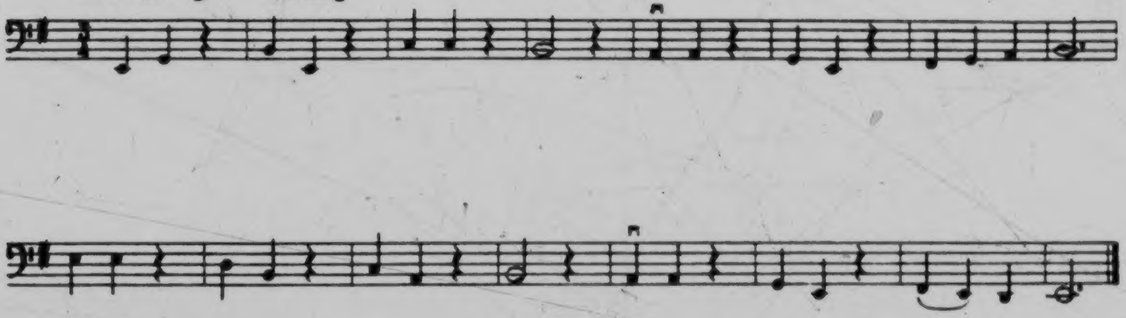
Instructional Level Guide

6 or fewer reading errors

6 or more memories

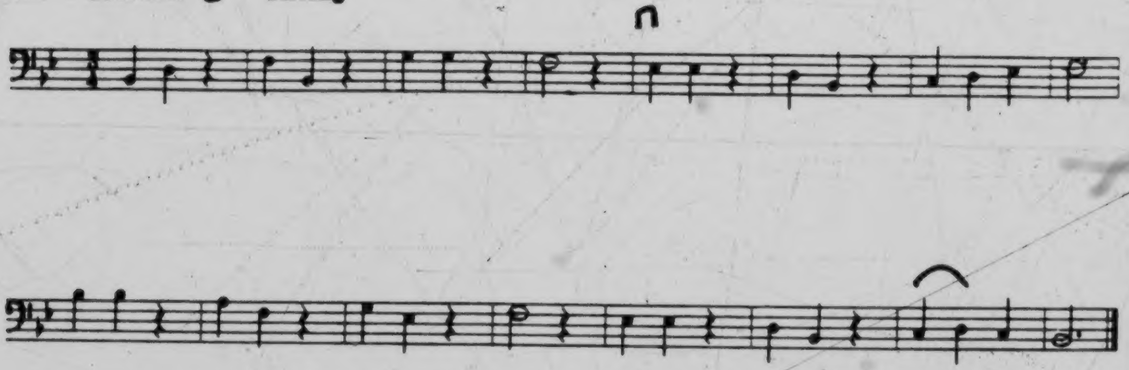
Reading Exercises - Violoncello

Exercise 5 **Lilting**



Reading Exercises - String Bass

Exercise 5 **Lilting**



Music Exercise # 5

Unprompted memories:

____Key signature (Cello - F # or key of G) (Bass - Bb,Eb; key of Bb)
____Time signature (3/4 time)
____Style (lilting)
____Types of notes (quarter, halves, dotted half)
____Rests (quarter)
____Special bowing (down bow for lift and /or slur)
____Pattern of two quarter notes followed by a quarter rest

Comprehension questions:

____What is the key signature? (Cello - F# or key of G) (Bass - Key of Bb; Bb,Eb)
____What is the time signature? (3/4 time)
____What style should it be played in ? (lilting)
____Bass - what position is this played in (half position)
____What special bowings are asked for in the music? (down bow)
____Slurred bow? (yes - one)
____What pattern of notes and rests was followed in most measures? (two quarter notes followed by a quarter rest)

Interpretive Question::

Bass: What position should this piece be played in and why?
Cello and Bass: Why was a slur bowing marked in the second last measure?

Acceptable answer: Yes____ No____

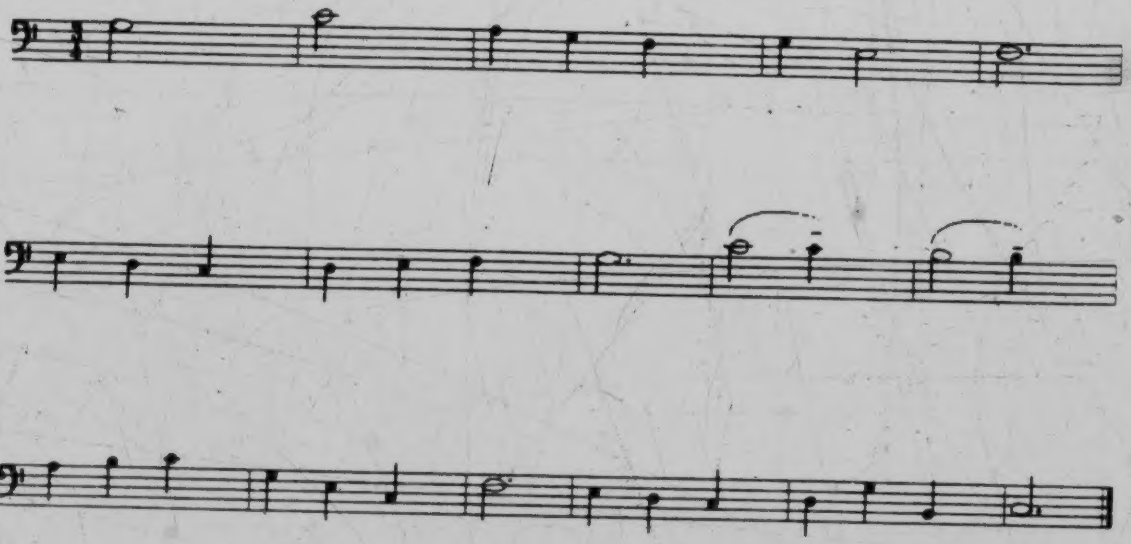
Instructional Level Guide

2 or fewer reading errors

5 or more memories

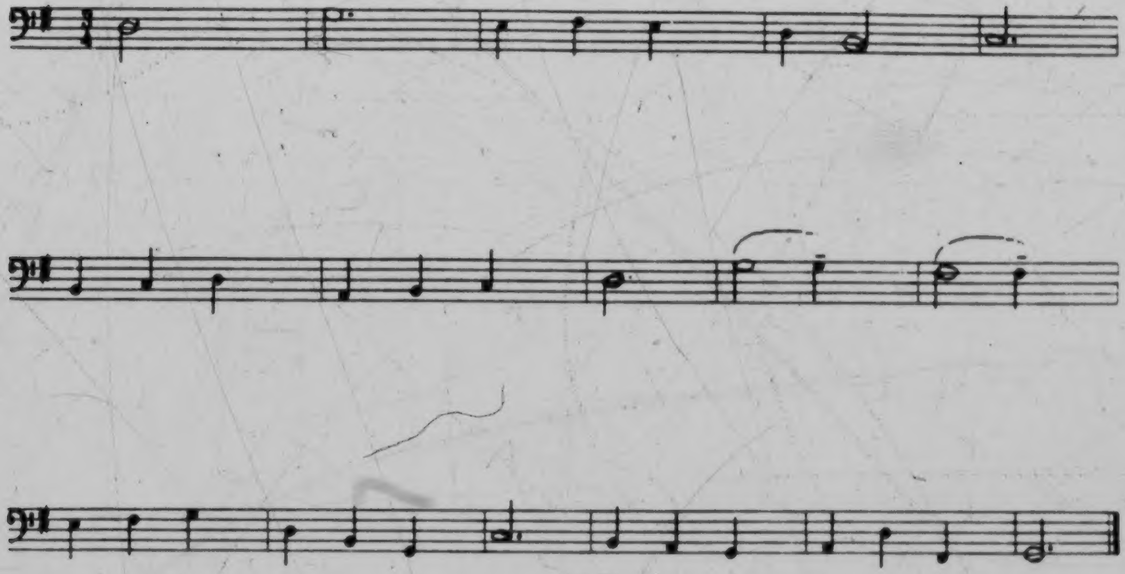
Reading Exercises - Violoncello

Exercise 6 **Waltz**



Reading Exercises - String Bass

Exercise 6 **Waltz**



Music Exercise # 6

Unprompted memories:

____Key signatures (Cello - no sharps or flats, key of C) (Bass - F#, key of G)
____Time signature (3/4 or waltz time)
____Style or special marking (waltz)
____Types of notes (dotted half, quarters, half)
____Portato bow
____No rests
____First position

Comprehension questions:

____What is the key signature? (Cello - no sharps/flats, key of C) (Bass - F# , key of G)
____What is the time signature? (3/4 or waltz time)
____Style or special marking (waltz)
____Types of notes (dotted half, quarters, half)
____Portato bow
____No rests
____First position

Interpretive questions:

What makes this piece "waltz style"?

Acceptable answer: Yes____ No____

Instructional Level Guide

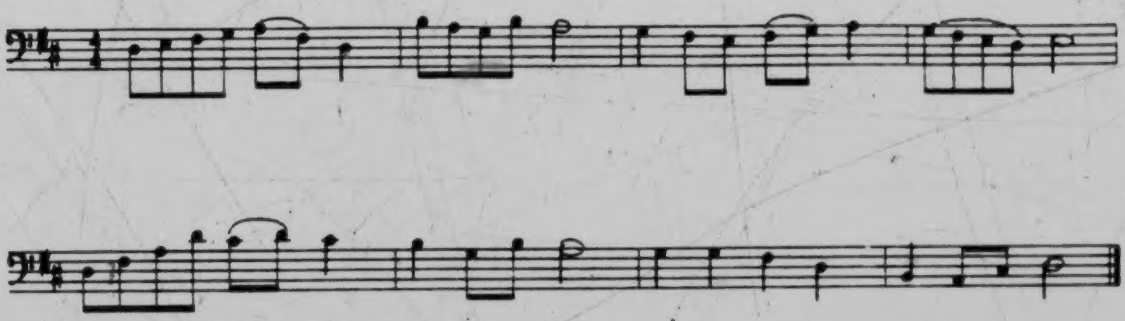
2 or fewer reading errrors

5 or more memories

Reading Exercises - Violoncello

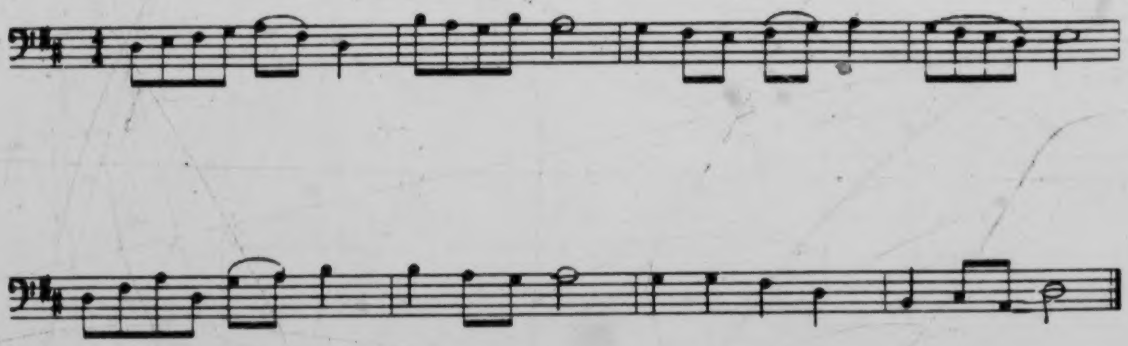
Exercise 7

Allegro



Reading Exercises - String Bass

Exercise 7 **Allegro**



Music Exercise # 7

Unprompted memories:

____Key signature (F#, C# or key of D)
____Time signature (4/4 or common time)
____Special markings - or style (Allegro, quick)
____Note values (eighth, quarter, half)
____No rests
____Special bowing - slurred bowing

Comprehension questions:

____What is the key signature? (F#,C# or key of D)
____What is the time signature? (4/4 or common time)
____What special markings, style marked in the music? (Allegro - quick)
____Is any special bowing marked in the piece? (slurred)
____Are there any rests? (no)
____What note values did you play (eighth, quarter, half)

Interpretive question:

What in the piece makes you suspect that it should be played quickly?

Acceptable answer: Yes____ No____

Instructional Level Guide

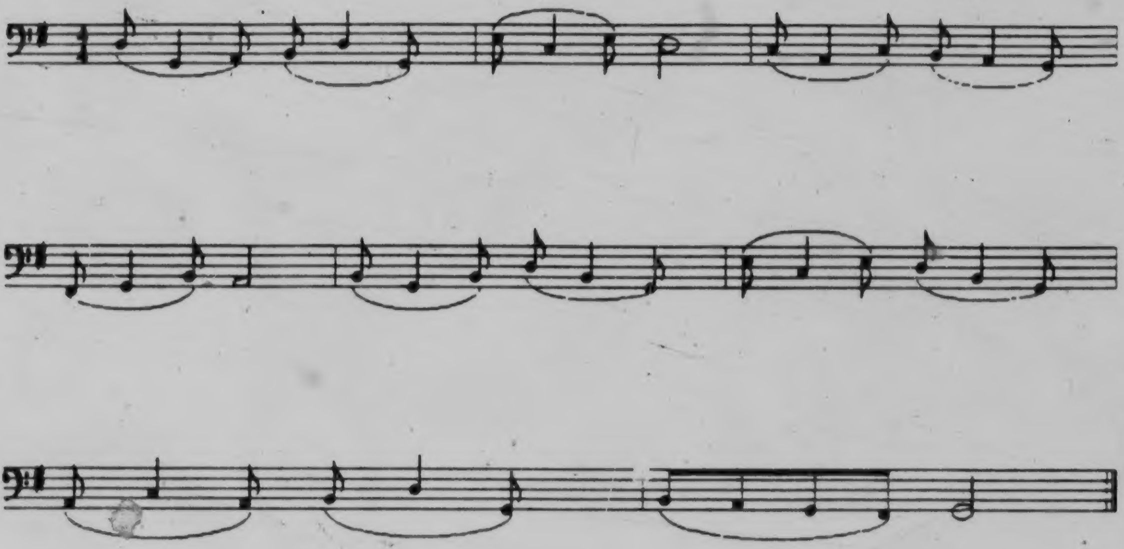
5 or fewer reading errors

4 or more memories

Reading Exercises - Violoncello

Exercise 8

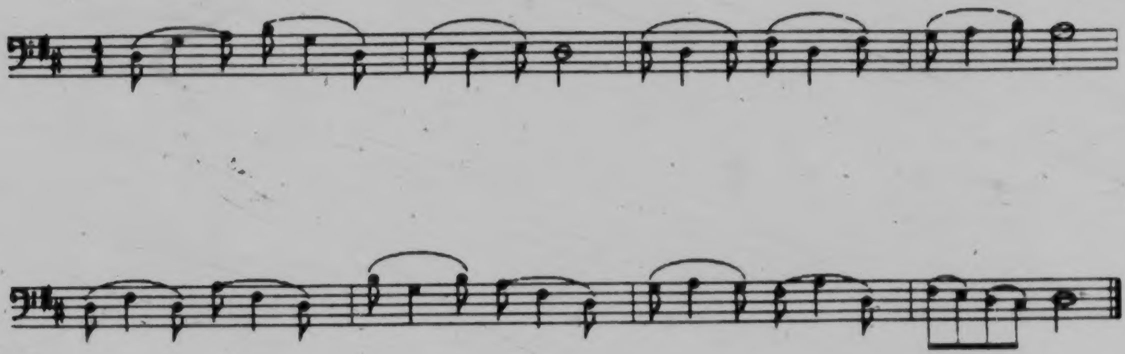
Andante



Reading Exercises - String Bass

Exercise 8

Andante



Music Exercise #8

Unprompted memories:

____Key signature (Cello - F# or key of G) (Bass - F#,C# , key of D)
____Time signature (4/4 or common time)
____Style or special markings at the beginning of the music (Andante or slow)
____Types of notes (eighth, quarters, half)
____Slurs (Cello - three and four notes slurred) (Bass - 2 and 3 notes slurred)
____No rests
____Rhythmic pattern of eighth, quarter, eighth recurred (syncopated rhythm)

Comprehension questions:

____What is the key signature? (Cello - F# or key of G) (Bass - F#,C# or key of D)
____What is the time signature? (4/4 or common time)
____What style should it be played in - or what special markings were at the beginning of the music? (Andante, or slowly)
____What bow markings were in the music? (slurs)
____Were there any rests? (no)
____What was the rhythmic pattern of each measure? (eighth, quarter, eighth, or syncopated rhythm)

Interpretive question:

If this music had been marked to be played quickly, what sort of music would it remind you of? (hoedown, jig, folk music)

Acceptable answer: Yes____ No____

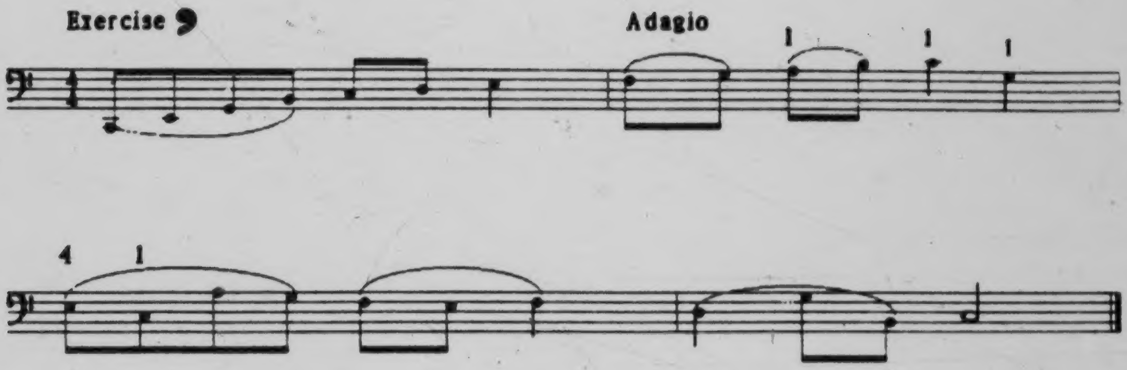
Instructional Level Guide

6 or fewer reading errors

5 or more memories

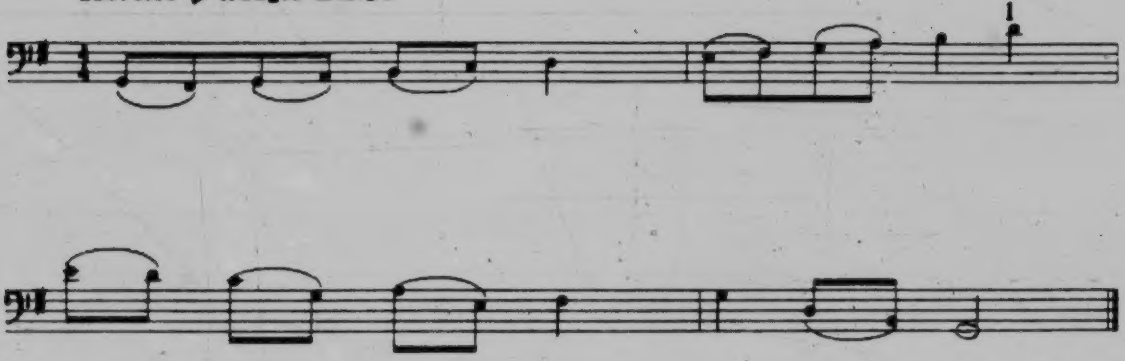
Reading Exercises - Violoncello

Exercise 9


Adagio
1
1
1
4
1

Reading Exercises - String Bass

Exercise 9 Adagio mm.50



Music Exercise #9

Unprompted memories:

____Key signature (Cello - key of C, no sharps or flats) (Bass - key of G, F#)
____Time signature (4/4 or common time)
____Bass - tempo indication of mm = 50
____Note values played (eighth, quarter, half)
____Slurred bowing
____Adagio marking
____No rests
____Played in first, second and fourth positions

Comprehension questions:

____What is the key signature?(Cello - no sharps or flats, key of C) (Bass - F# or key of G)
____What is the time signature? (4/4 or common time)
____What markings were in the piece? (Adagio) (Bass - Adagio mm = 50)
____What kind of bowing was required? (Slurred 2 , 3 and 4 notes) (Bass slur 2 notes)
____Were there any rests? (no)
____What note values did you play? (half, quarter, eighth)
____What positions did you play in? (First, second and fourth positions)

Interpretive Question:

What was the purpose of the marked fingering? (show where to shift)

Acceptable answer: Yes____ No____

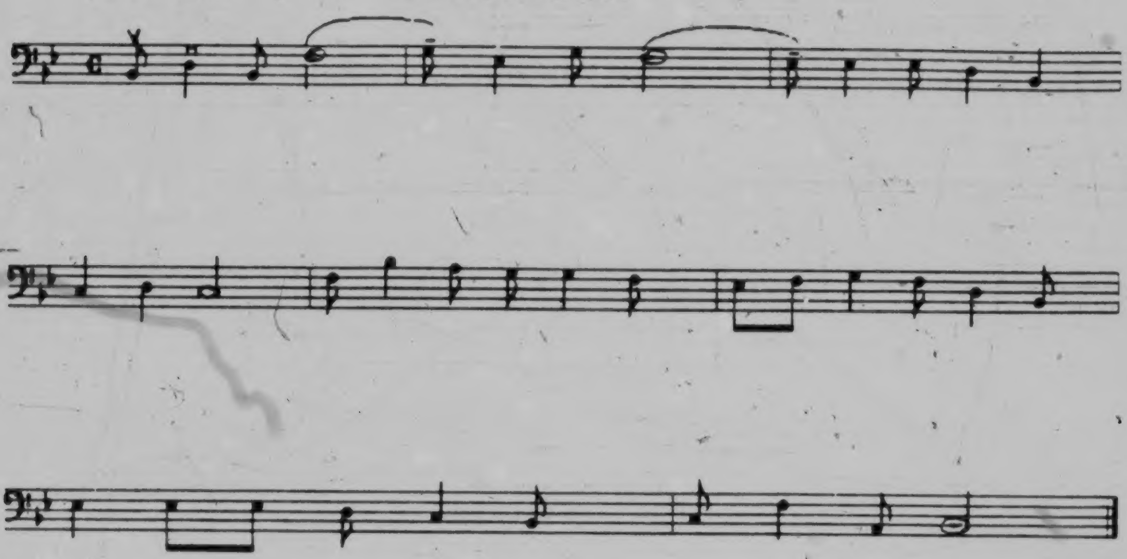
Instructional Level Guide

3 or fewer reading errors

6 or more memories

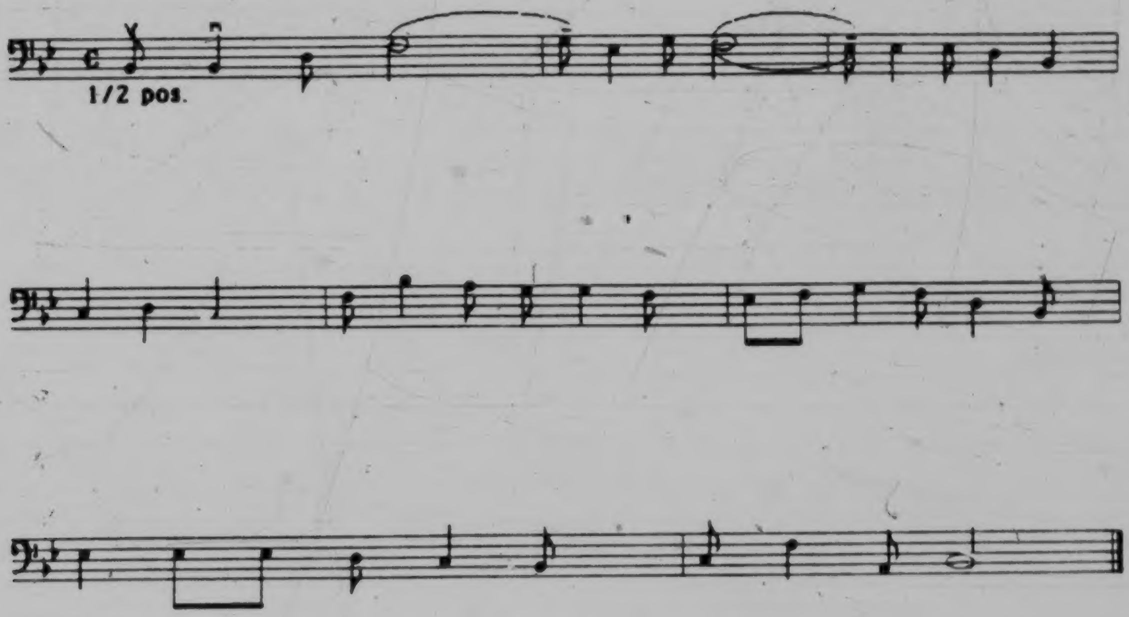
Reading Exercises - Violoncello

Exercise 10 **Moderato mm.96**



Reading Exercises - String Bass

Exercise 10 Moderato mm.96



Music Exercise # 10

Unprompted memories:

____Key signature (Bb,Eb or key of Bb)
____Time signature (Common time or 4/4 time)
____Rhythm (syncopated)
____Style (Moderato)
____Tempo marking (mm = 96)
____Types of notes (eighth, quarter, half)
____Up bow marked)
____Portato markings across the bar line
____Bass played in half position
____No rests

Comprehension questions:

____What is the key signature? (Bb,Eb or key of Bb)
____What is the time signature? (Common time or 4/4 time)
____What markings? (Moderato; mm = 96)
____What value of notes were in the piece? (eighths, quarters, half)
____What was the rhythmic style of the piece (syncopated, jazzy)
____What bow markings were in the piece? (portato)
____What kind of bow did the piece begin on ? (up bow)
____Bass - what position should this piece be played in? (1/2)
____Any rests? (no)

Interpretive questions:

Why was an up bow marked to start the piece, and on a strong beat?

Acceptable answer: Yes____ No____

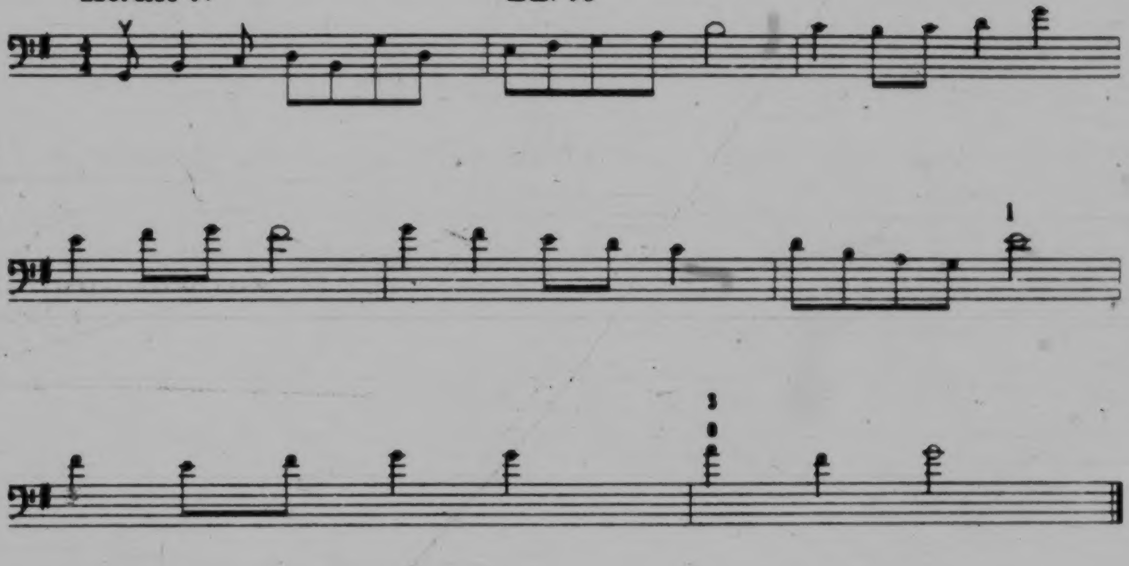
Instructional Level Guide

5 or fewer reading errors

6 or more memories

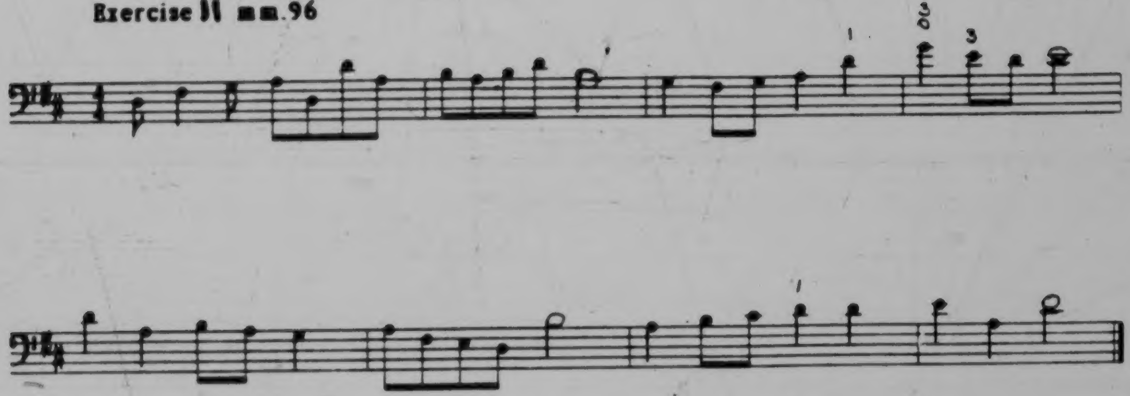
Reading Exercises - Violoncello

Exercise 11 **mm. 96**



Reading Exercises - String Bass

Exercise 11 mm.96



Music Exercise # 11

Unprompted memories:

____Key signature (Cello - F# or key of G) (Bass - key of D, F#, G#)
____Time signature (4/4 time or Common time)
____Values of notes (Eighth, quarter, half)
____Tempo (mm = 96)
____Harmonic asked for
____Highest note (Cello - A harmonic; Bass - G harmonic)
____No rests
____No ties or slurs

Comprehension questions:

____What is the key signature? (Cello - F# or key of G) (Bass - key of D; F#,C#)
____What is the time signature? (4/4 or Common time)
____What note values were in the piece (eighth, quarter, half)
____What does the marking of 3 with a 0 underneath mean? (play harmonic)
____What tempo was asked for? (mm = 96)
____What was the highest note of the piece? (Cello - harmonic A; Bass - harmonic G)
____Were there any rests in the piece? (no)
____Were there any ties or slurs in the piece? (no)

Interpretive Questions:

Why was the first finger marking put in the piece?

Acceptable answer: Yes____ No____

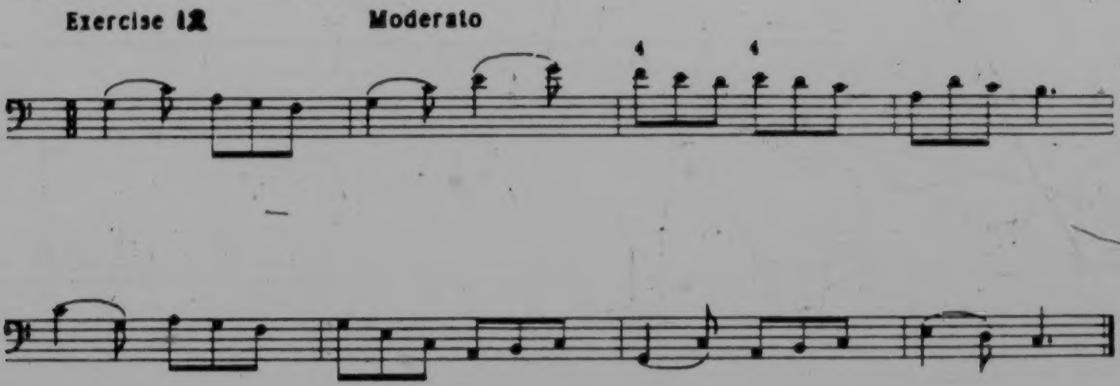
Instructional Level Guide

6 or fewer reading errors

4 or more memories

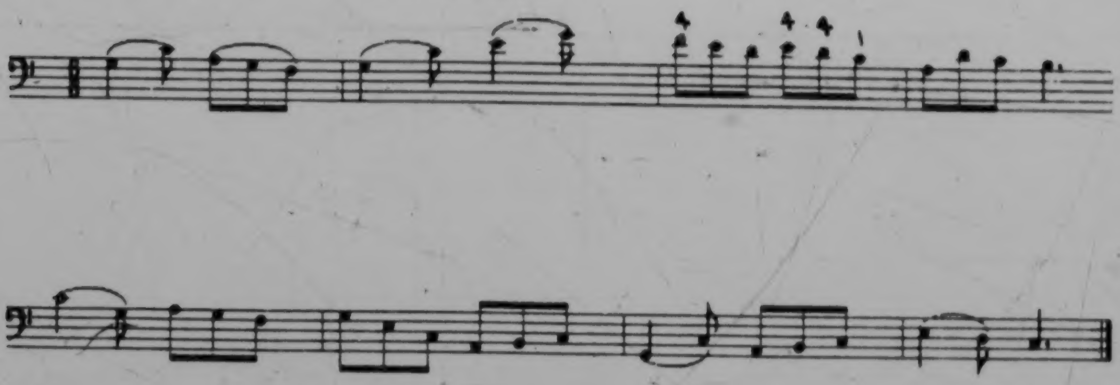
Reading Exercises - Violoncello

Exercise 12


Moderato
4
4

Reading Exercises - String Bass

Exercise 12 **Moderato-lilting**



Music Exercise # 12

Unprompted memories:

____Key signature (no sharps or flats; C major)
____Time signature (6/8 time)
____Rhythmic style (in two)
____Values of notes (quarters, eighths, dotted quarters)
____Slurred bowing (so each measure starts on down bow)
____Style - special marking (Cello - moderato; Bass - moderato, lilting)
____Some fingerings marked in
____No rests

Comprehension questions:

____What is the key signature? (no sharps or flats; C major)
____What is the time signature? (6/8 time)
____How many beats in each measure? What rhythmic style should it be played in? (in two)
____What bow markings were in the piece? (slurs)
____What note values? (quarters, eighths, dotted quarters)
____What special style marking on the piece (Cello - moderato; Bass - moderato, lilting)

Interpretive question:

Why were some notes slurred in the music?

Acceptable answer: Yes ____ No____

Instructional Level Guide

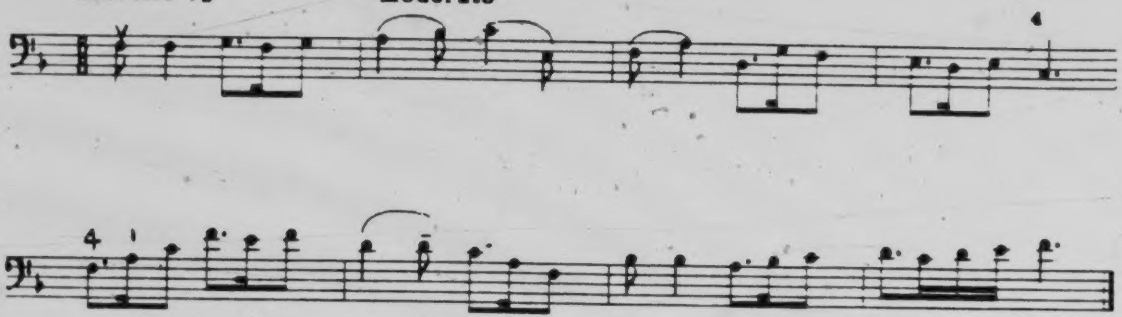
2 or fewer reading errors

5 or more memories

Reading Exercises - Violoncello

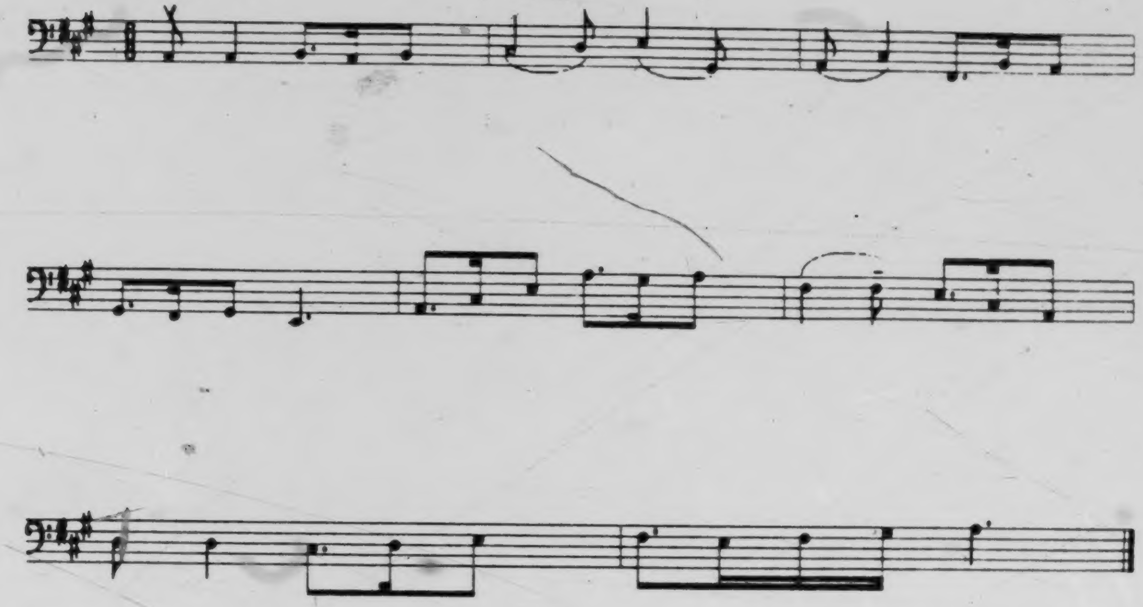
Exercise 13

Moderato



Reading Exercises - String Bass

Exercise 13 **Moderato**



Music Exercise #13

_____Key signature (Cello - one flat, Bb or key of F) (Bass - F#, C#, G# or key of A)
____Time signature (6/8)
____Style (Moderato)
____Rhythms (syncopation; dotted rhythms)
____Quarter notes, dotted quarters, eighths, dotted eighths, sixteenths
____Started on an up bow
____Shifting required (Cello , 1st and 4th; Bass - 1/2 and 1st)
____Slurred bowing
____Portato bowing
____No rests

Comprehension questions:

____What is the key signature?(Cello-One flat, Bb or key of F) (Bass - F#,C#,G#, key of A)
____What is the time signature? (6/8 time)
____What rhythmic style should it be played in ? (two beats per bar)
____What markings were in the piece? (Moderato)
____Note values (quarter, dotted quarter, eighths, dotted eighths, sixteenths)
____What kinds of bowing were marked in the piece? (slur, portato)
____Portato bowing
____What positions were you asked to play in? (Cello - first and fourth; Bass - first and half)
____What kind of bow did the piece start with? (Up bow)

Interpretive Question:

This rhythm is often used in what kind of music - a particular ethnic music?

Acceptable answer: Yes____ No____

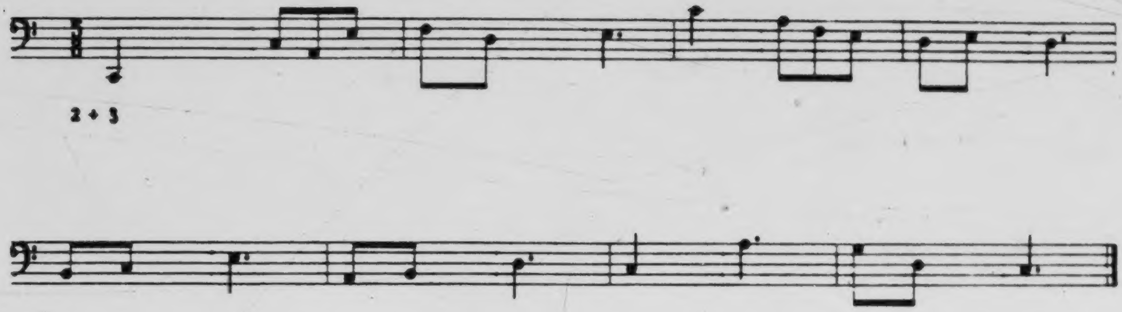
Instructional Level Guide

4 or fewer reading errors

5 or more memories

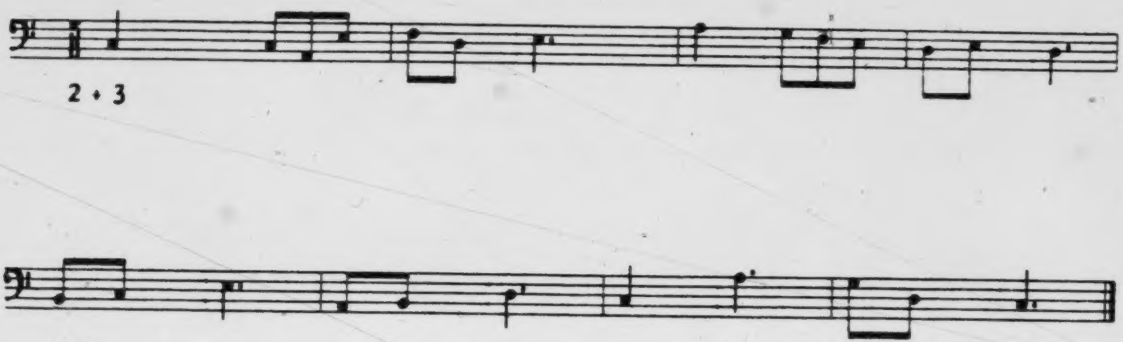
Reading Exercises - Violoncello

Exercise 14 **Andante**



Reading Exercises - String Bass

Exercise 14 **Andante**



Music Exercise #14

Unprompted memories:

____Key signature (no sharpts or flats, key of C)
____Time signature (5/8 time)
____Rhythmic style (2 plus 3)
____Types of notes (quarters, eighths, dotted quarters)
____Andante
____Minor tonality
____No rests

Comprehension questions:

____What is the key signature? (No sharps or flats; key of C)
____What is the time signature? (5/8 time)
____What style should it be played in? (andante, or slowly)
____Rhythmic directions? (2 + 3)
____Other special markings? (Andante)
____What sort of tonality - major or minor? (Minor)

Interpretive question:

What century of music is the rhythm of this piece associated with?

Acceptable answer: Yes ____ No____

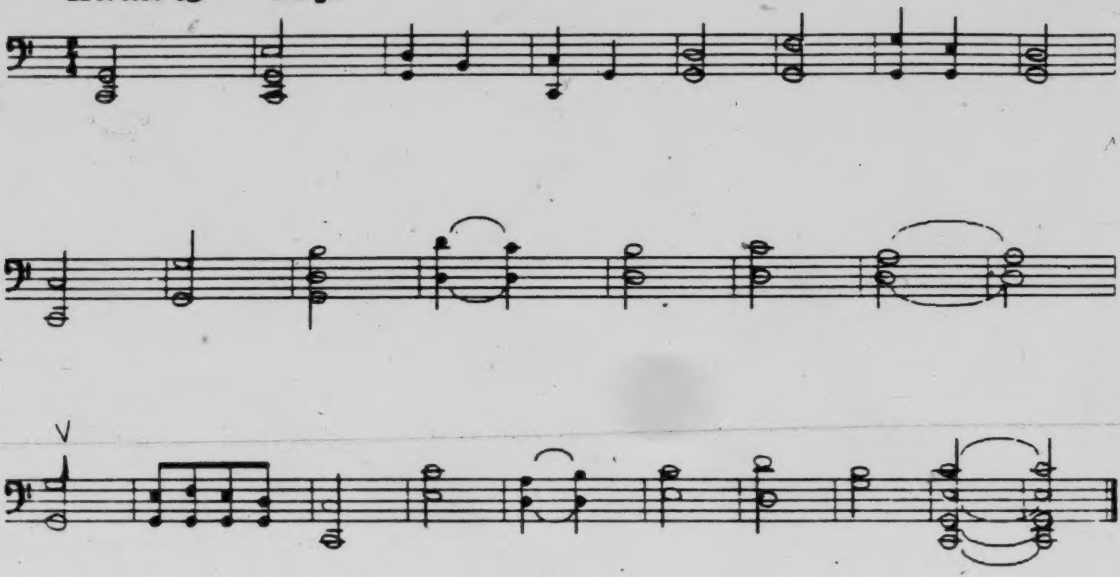
Instructional Level Guide

4 or fewer reading errors

4 or more memories

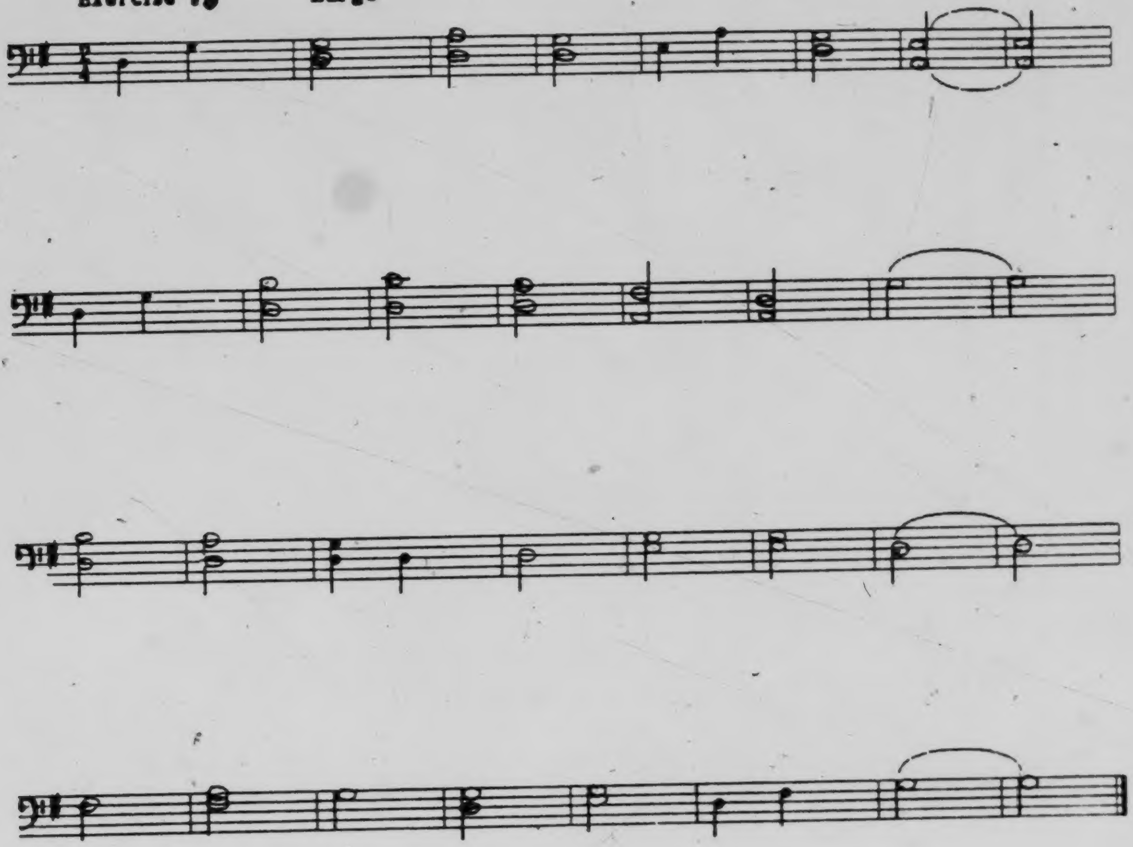
Reading Exercises - Violoncello

Exercise 15 **Largo**



Reading Exercises - String Bass

Exercise 15 **Largo**



Music Exercise #15

Unprompted memories:

____Key signature (Cello - no sharps or flats, key of C) (Bass - F#, key of G)
____Time signature (2/4)
____Markings (Largo)
____Types of notes (half, quarter, eighths, tied halves)
____Slurs
____ Bass - double stops ; Cello, triple and quadruple stops
____Tied notes
____Up bow marking

Comprehension questions:

____What is the key signature? (Cello - no sharps or flats; Bass - F#, key of G)
____What is the time signature? (2/4)
____What tempo markings were on the music? (Largo)
____What special bowing was required? (Cello - double and triple stops; Bass - double stops)
____Were there any slurs marked in the music? (Yes)
____What note values were in the piece? (half, quarter)
____Tied notes?
____Any bow markings? (up bow)

Interpretive question:
Cello - how do you play the four notes at once as in the last chord?
Bass - how would you play three notes at once or a triple-stop?

Acceptable answer: Yes____ No____

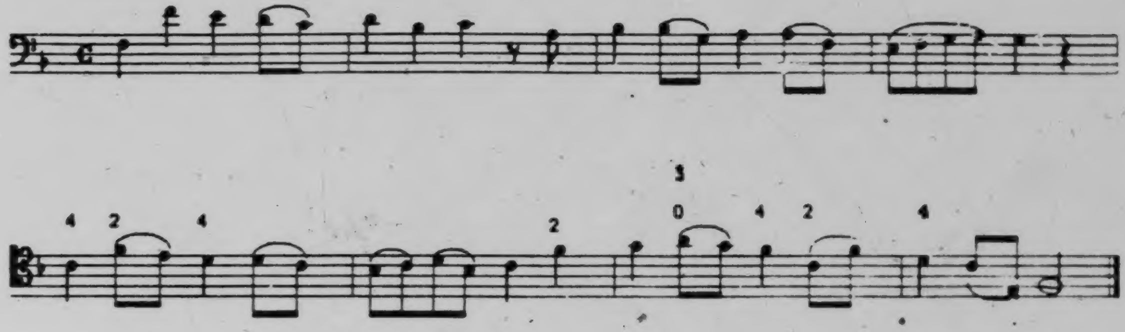
Instructional Level Guide

3 or fewer reading errors

5 or more memories

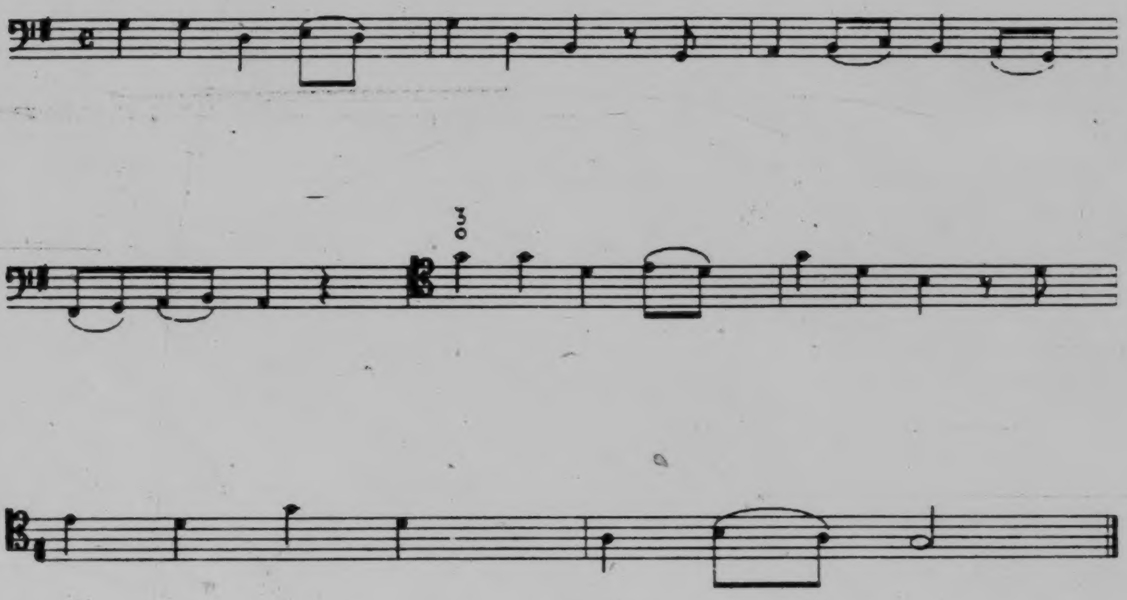
Reading Exercises - Violoncello

Exercise 16 **Largo**



Reading Exercises - String Bass

Exercise 16 **Largo**



Music Exercise # 16

Unprompted memories:

____Key signature (Cello - one flat, Bb or key of F major) (Bass - F # , key of G)
____Time signature (Common time0
____Marking (Largo)
____Quarters, halves, eighth notes
____Bowing (slurs)
____Tenor clef
____Harmonic
____Shifting
____Eighth and quarter rest

Comprehension questions:

____What is the key signature? (Cello - Bb or key of F) (Bass - F # or key of G)
____What is the time signature? (Common time)
____What temo marking was on the music? (Largo)
____What bow markings (Slurs)
____What clefs were used? (Bass and tenor clefs)
____What does the 3 with a 0 under it, marked above a note mean? (play the harmonic)
____Are there any rests? (yes - 1/8th and 1/4 rest)
____Any shifting in the music? (yes; Bass - 1st, 4th & 6th positions; Cello - several)
____What note values in the music (1/4, 1/2. 1/8)

Interpretive question:
Why was the tenor clef used for the second half of the exercise?

Acceptable answer: Yes____ No____

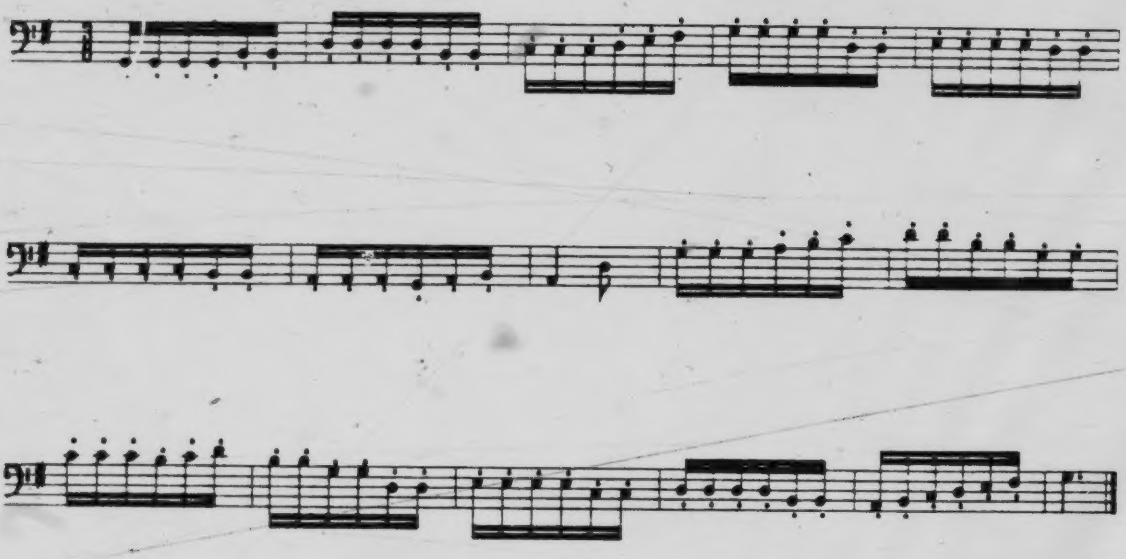
Instructional Level Guide

5 or fewer reading errors

7 or more memories

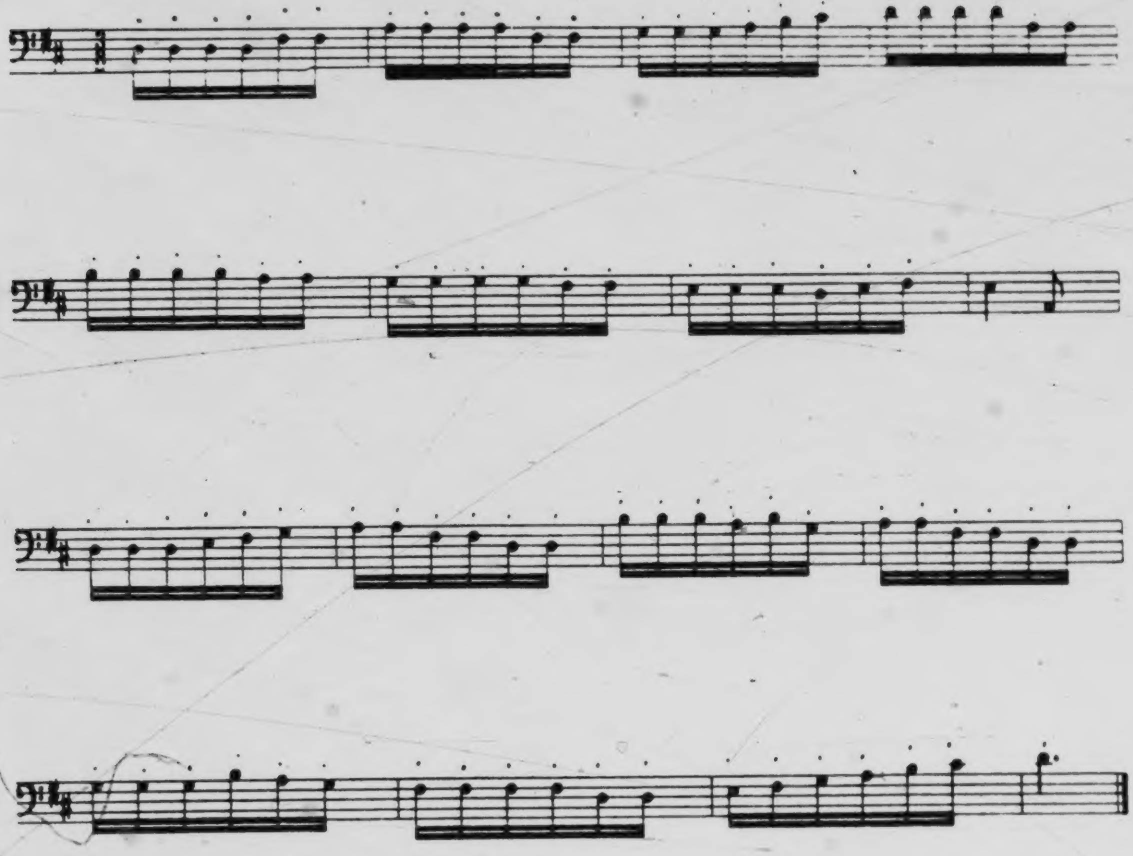
Reading Exercises - Violoncello

Exercise 17 **Spiccato**



Reading Exercises - String Bass

Exercise 17 **Spiccato**



Music Exercise # 17

Unprompted memories:

____Key signature (Cello - one sharp, F# or key of G) (Bass - F#,C# or key of D)
____Time signature (3/8 time)
____Style of bowing (spiccato)
____Types of notes (16th notes mostly, a quarter and an eighth, dotted quarter)
____How style of bowing indicated (Dots under notes)
____Clefs (Bass clef)
____Rests (No)
____Shifts (Bass - 3rd position; Cello - no)

Comprehension questions

____What is the key signature? (Cello - F# or key of G) (Bass - F#,C# or key of D)
____What is the time signature? (3/8 time)
____What bowing style should it be played in? (spiccato)
____What clefs were used? (Bass clef)
____What types of notes? (Mostly 16th notes, a quarter and an eighth)
____What bowing indications (dots under notes)
____Any rests in the music? (no)
____Any shifting in the music? (Cello - no; Bass - yes, 3rd position)

Interpretive question:

If spiccato had not been marked at the top of the piece, what other type of bowing might have been suitable? (detache or staccato)?

Acceptable answer: Yes____ No____

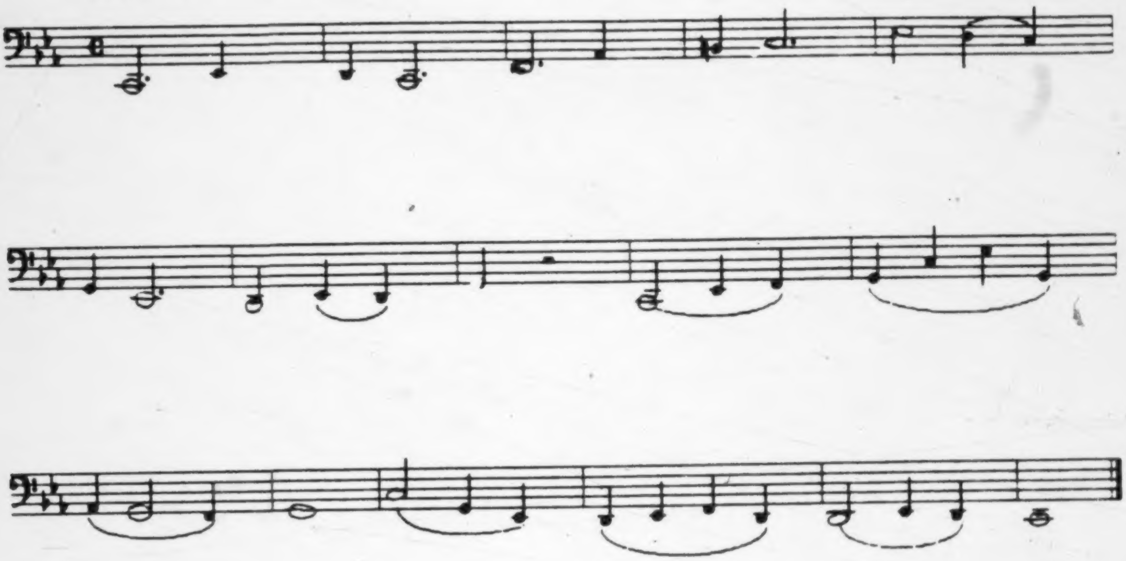
Instructional Level Guide

3 or fewer reading errors

7 or more memories

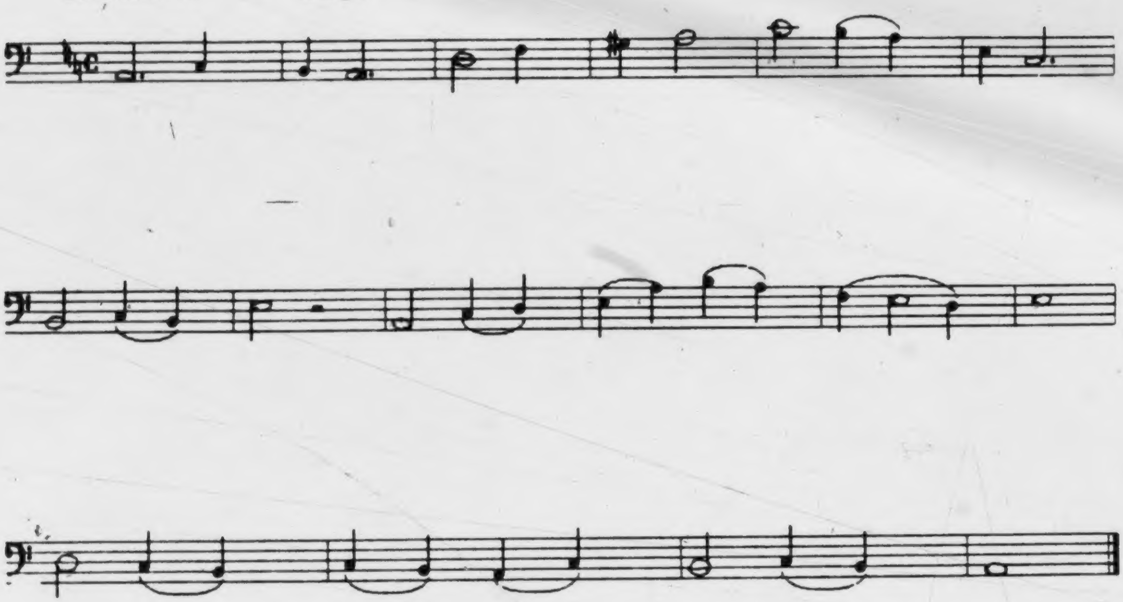
Reading Exercises - Violoncello

Exercise 18. **Largo**



Reading Exercises - String Bass

Exercise 18 **Largo**



Music Exercise # 18

Unprompted memories:

____Key signature (Cello - 3 flats, Bb,Eb,Ab or key of C minor) (Bass -no sharps or flats; key of A minor)
____Time signature (Common time)
____Style (slowly or Largo)
____Types of notes (dotted half notes, quarters, whole, half notes)
____Slurs
____Minor key
____Rests (1/2)
____Accidentals (a natural sign in cello, a sharp in the bass)

Comprehension questions:

____What is the key signature? (Cello - Bb,Eb,Ab or key of C minor; Bass - no sharps or flats or key of A minor)
____What is the time signature? (Common time)
____What style should it be played in (Legato, slow, Largo)
____What bowing markings were there (Slurs)
____What was the tonality of the piece, major or minor? (minor)
____What values of notes were include? (dotted half, quarters, whole notes)
____Were there any rests in the piece? (yes -1/2 rest)
____Any accidentals in the piece? (yes - a natural in the cello and a sharp in the bass)

Interpretive question:

What style of bowing would be most suitable for this piece?

Acceptable answer: Yes____ No____

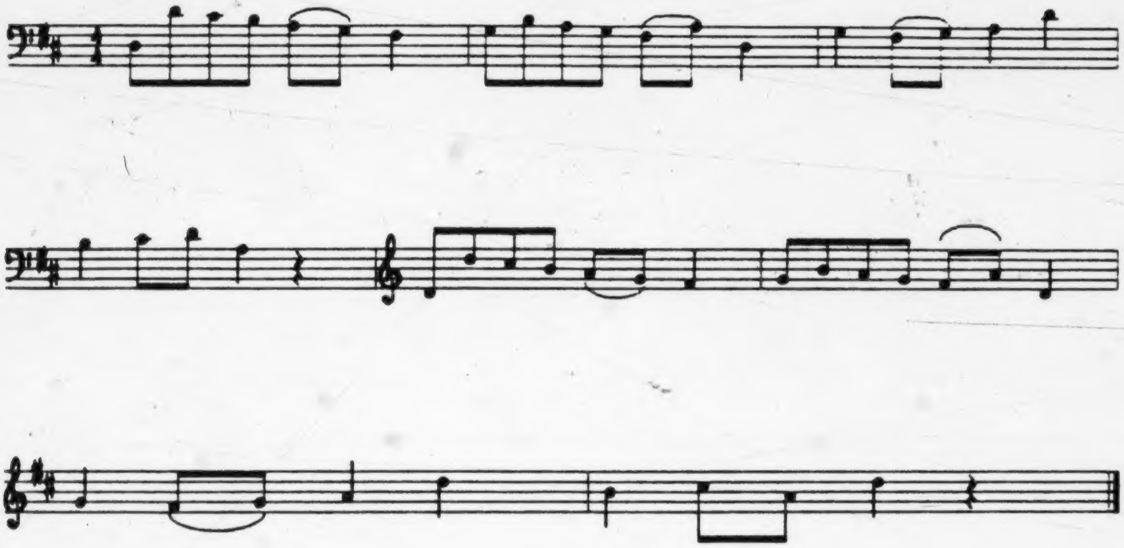
Instructional Level Guide

3 or fewer reading errors

6 or more memories

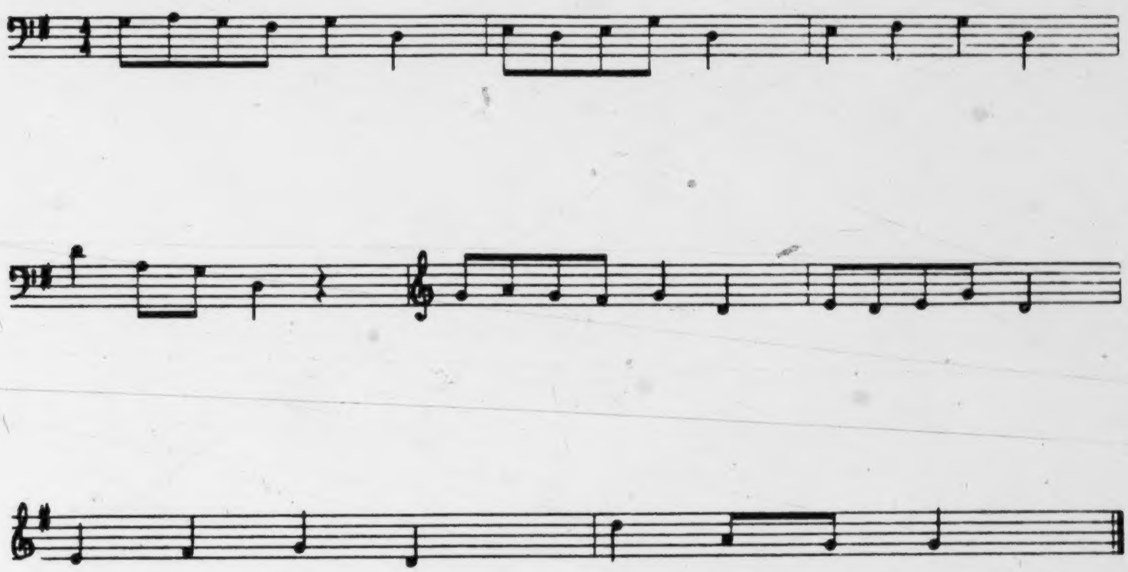
Reading Exercises - Violoncello

Exercise 19. **Moderato**



Reading Exercises - String Bass

Exercise 19 **Moderato**



Music Exercise # 19

Unprompted memories:

____Key signature (Cello - 2 sharps, F#,C# or key of D) (Bass F# or key of G)
____Time signature (4/4 or Common time)
____Eighth notes, quarters, half notes
____Clefs (Bass clef, treble clef)
____Markings (Moderato)
____1/4 rests
____No fingerings
____Slurs
____Same pattern, mostly the same tune one octave above in the treble clef
____Bass - harmonic

Comprehension questions:

____What is the key signature? (Cello - F#,C# or 2 sharps, or key o D) (Bass - F# or key of G)
____What is the time signature? (4/4 or Common time)
____What tempo marking was on the music? (Moderato)
____What clefs were used? (Bass clef, treble clef)
____What bow markings? (slurs)
____Any marked fingerings? (No)
____Any rests in the music? (1/4 rests)
____What did you notice about the tune in the treble clef (it was mostly the same but an octave higher than when presented in the bass clef)

Interpretive question:
Why was the treble clef and not the tenor clef used in this piece?

Acceptable answer: Yes____ No____

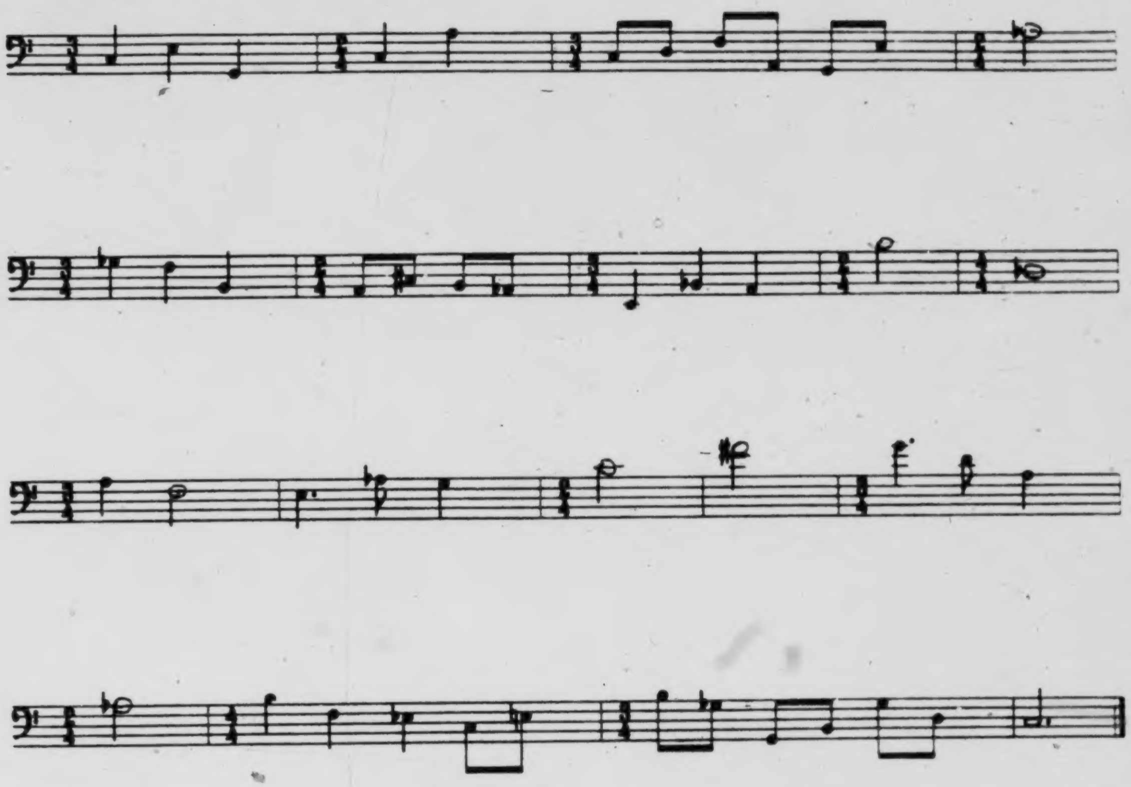
Instructional Level Guide

4 or fewer reading errors

8 or more memories

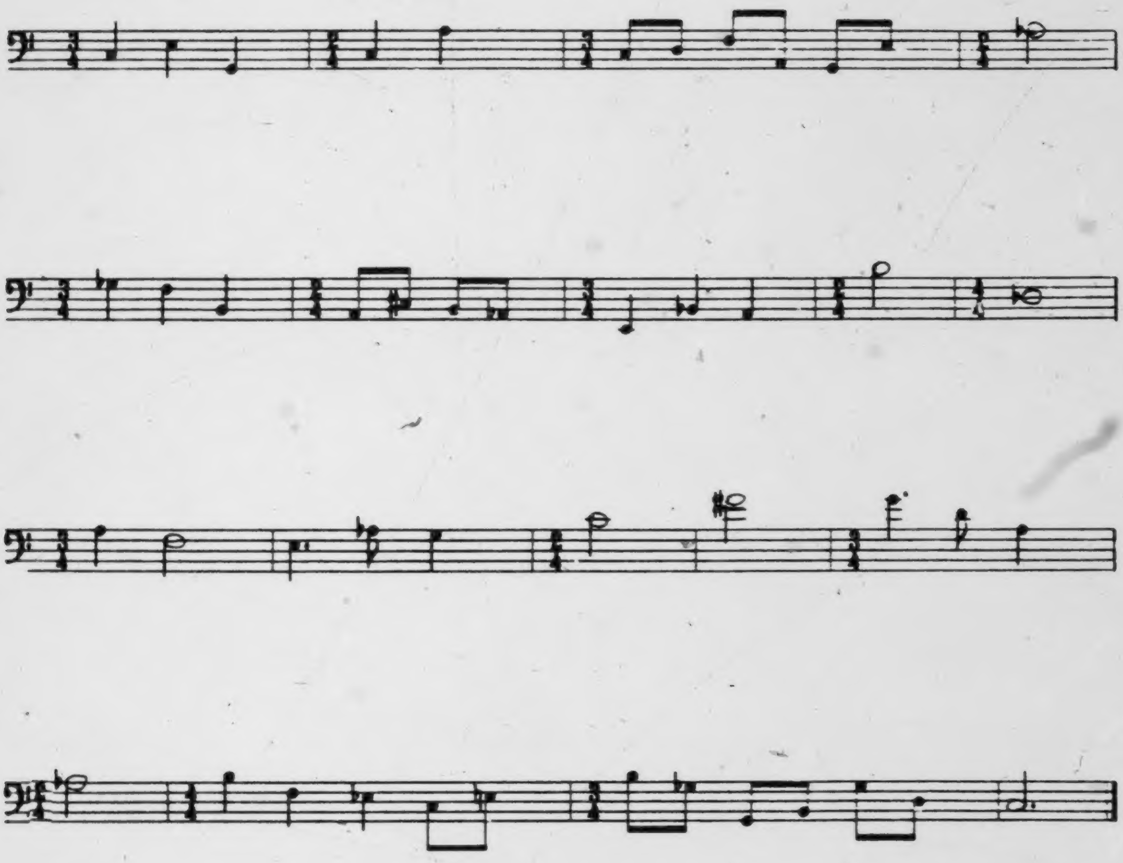
Reading Exercises - Violoncello

Exercise 20 **con Spirito**



Reading Exercises - String Bass

Exercise 20 **con Spirito**



Music Exercise #20

Unprompted memories:

_____Key signature (no sharps or flats; key of C)
_____Time signature (2/4, 3/4, 4/4, changing throughout)
_____Markings (quickly, con spirito)
_____Rhythmically changing
_____No pattern
_____No clear tonality
_____Accidentals marked in
_____20th century style, or Atonal
_____Note values in the piece (whole, dotted half, dotted quarter, eighth, quarter)

Comprehension questions:

_____What is the key signature? (no sharps or flats, key of C)
_____What time signatures are used? (3/4 time, alternating with 2/4 time and 4/4 time)
_____What style should it be played in? (lightly, quickly)
_____What markings? (Con spirito)
_____Tonality? (Atonal)
_____Any accidentals? (Yes - sharps, flats)
_____What century do you believe this music might have been written in by its style?
_____What note values were in the piece (dotted half, dotted quarter, whole)

Interpretive question:
Why is this more difficult to play than the previous pieces?

Acceptable answer: Yes____ No____

Instructional Level Guide

8 or fewer reading errors

8 or more memories

APPENDIX B

Examples of Coding and Categorizing of Students' Responses

Text Miscue Analysis

From passage pages in the Bader Reading and Language Inventory (Bader, 1983) (93 95 105 111)

Reading Miscue Inventory Coding Sheet - - - - - Reader Duke

		Reader	Text	Graphic Sim Y	Graphic Sim P	Graphic Sim N	Sound Sim Y	Sound Sim P	Sound Sim N	Grammatical Function Y	Grammatical Function P	Grammatical Function N	Gram Accep YPN	Sem Accep YPN	Meaning Change YPN
I ⑥	1	constellation	constellations	✓			✓			✓			Y	Y	P
	2	you	one		✓				✓	✓			Y	Y	P
	3	re[illegible]nized	recognized	✓			✓					✓	N	N	N
	4	official	officially	✓			✓				✓		P	P	P
	5	of	for	✓					✓	✓			Y	Y	Y
	6	everyone	anyone	✓			✓			✓			Y	Y	P
	7	—	a			✓			✓			✓	Y	Y	Y
	8	ships	ship	✓			✓			✓			Y	Y	P
	9														
I 7	10	would	—			✓			✓			✓	Y	Y	Y
	11	show	shows	✓			✓			✓			Y	Y	P
	12	would	—			✓			✓			✓	Y	Y	Y
	13	listeners	listener	✓			✓			✓			Y	Y	Y
	14														
I 8	15	for	—			✓			✓			✓	P	P	
	16	had	—			✓			✓			✓	Y	Y	Y
	17	and	an	✓			✓					✓	P	P	Y
	18	that	—			✓			✓			✓	Y	Y	Y
	19														
F 9/10	20	clipper	clippers	✓			✓			✓			Y	Y	Y
	21	was	were		✓			✓		✓			Y	Y	Y
	22	would	—			✓			✓			✓	P	Y	P
	23	slice	sliced	✓			✓			✓			P	Y	P
	24	vessel	vessels	✓			✓			✓			P	P	P
	25	and	with			✓			✓	✓			Y	Y	P
	26														
	27														
	28														
	29														

Music Miscue Analysis

Y₂ Music Reading Miscue Coding Name Dina Corrected ____ Uncorrected ✓

#	Played	Written	Bowing Y	Bowing P	Bowing N	Rhythm Y	Rhythm P	Rhythm N	Pitch Y	Pitch P	Pitch N	Intonation Y	Intonation P	Intonation N	Composer's Intent Y	Composer's Intent P	Composer's Intent N	Musically Acceptable Y	Musically Acceptable P	Musically Acceptable N
I 4	𝅗𝅥	♩	✓					✓	✓			✓					✓		✓	
	♩	𝅗𝅥	✓					✓	✓			✓					✓		✓	
	♪	𝅝 I	✓					✓	✓			✓					✓		but very well clearly [illegible] while performed key	✓
	𝅗𝅥.	𝅗𝅥	✓					✓	✓			✓					✓			✓
	𝅗𝅥.	𝅝	✓					✓	✓			✓					✓			✓
	♩.	♩	✓					✓	✓			✓					✓			✓
5	hand position too high		✓					✓		✓				✓	✓					✓
	A♭	A♮ F	✓					✓			✓	✓					✓	✓		
	♪	𝅗𝅥.	✓				✓		✓			✓				✓			✓	
	E♮	E♭ in key sig	✓			✓					✓		✓				✓			✓
6	𝅝	𝅗𝅥. F	✓					✓	✓			✓					✓		✓	
	𝅗𝅥	♪	✓					✓	✓			✓					✓			✓
	F♮	F♯ in key signature	✓			✓				✓			✓			✓			✓	
	𝅗𝅥	𝅗𝅥.	✓					✓	✓			✓					✓			✓
	E 1st finger	D open string	✓			✓					✓	✓					✓			✓
II 7	♩	𝅗𝅥	✓					✓	✓			✓					✓			✓
	speed altered (slowed to accommodate finger setting)		✓				✓		✓			✓					✓		✓	
	E, 1st finger	D open string	✓			✓					✓	✓					✓		✓	
	speed slowed down	I	✓				✓		✓			✓					✓		✓	
	♩	♩	✓					✓	✓			✓					✓			✓
	B 1st finger slower	A open string	✓				✓				✓	✓					✓			✓
	E 1st " slower	D " "	✓				✓				✓	✓					✓			✓
II 8	♪♪♪ for	♩♩♩	✓					✓	✓			✓					✓	✓		
	E 1st finger	D open string I	✓				✓				✓	✓					✓		✓	
	F♯ for 4th finger	D " "	✓				✓				✓	✓					✓		✓	

Ebed
I mean

F

Y = Highly acceptable P = Partially acceptable N = Not acceptable

Text Recall Analysis

(Recall of passage pages (99 & 105), of Bader Reading and Language Inventory (Bader, 1983)

7 C/A RADIO

Before television people listened to the radios / from 1920 to 1940 / .....there are variety shows / there are spies, westerns, comedies and science fiction / (and ---) they could make all different sounds / (-superman-) Clarke Kent changing into superman / (and --- there's people using) there's actors doing the script/ and there's the sound effect people / who'd make all the noises / like thunder crashing and everything / and nowadays straight radio is used for words - towards speaking like - and music and codes and stuff (---and that's about that I think).

8 C/A SHOPPING TRIP

Gene and Kim were going to all the shopping malls and stores looking for stuff for their camping trip / and one of their neightbors said / that he (had - he) used a store catalogue - mail order - to get all his shopping stuff / - so they used that / and one of them noticed that there was three ways of getting your stuff / (and there) you could telephone (and mail) and mail it / or you could go to a mail order counter / and they were happy / because the catalogue said / what sizes they had in (their camping boots) their hiking boots / and they didn't think' that (not going to) going to the stores was so bad / cause then they could compare prices with their stuff.

Music Recall Analysis

Music Recall Analysis

I 4 A G C
4/4 time mostly open strings there's no shifting

[illegible] 5
A 3/4 timing
C there's a rest in every bar(expect one no) except for 2
C there was mostly quarter notes
A and there's one slur
A and in the key signature there's 2 flats (but I'm not sure which ones)
)and that's about it)

F F 6 A B A
3/4 timing there was an F♯ and it was marked a waltz
G and there was lots of half notes and lots of dotted 1/2 notes
(and there's ? I'm not sure of bars)

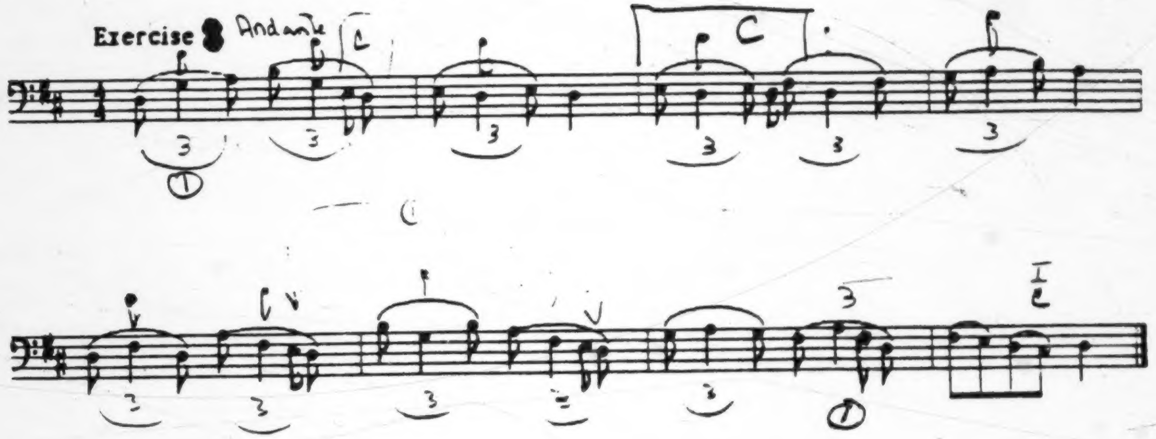
II 7 A A B
4/4 time 2 sharps one of them was F♯
D It was mostly 8th notes
D there were slurs
A and it was allegro

II 8 A A i B
Andante 4/4 time 2 sharps an[illegible] F and a C♯
G and....there was mostly quarter notes
D and there were slurs
(and that's about it)

Coding of a Music Exercise

Reading Exercises - String Bass

Exercises 1-19



Missed the syncopated rhythm & played the same rhythmic error throughout (triplets for B F G ①

Confused D-open string with E 1st finger often – corrected it the first time but not later ①

Confuses 4th line F# [illegible] [illegible] sometimes (twice – once D for F# once F for [illegible] ①

Corrected one

APPENDIX C

Letter of Request for Participants and Parents

Request for Permission for Students to Become Part of a Research Project being Conducted by Patricia Brine, 1985

I am currently engaged in studies leading to a Master's degree in Elementary Education in Reading for the purpose of learning as much as I can about how children read and with the intent of becoming more effective in helping children learn to read music. I will be trying to find out if there are similarities in the processes used in reading in both music and written language. If I find that there are many similarities, I will be looking into how they may be used to improve teaching of reading in music.

I am asking your permission as parents, and with the consent and cooperation of your child, that I be allowed:

1. to interview you and your child and speak with you about his/her reading and musical history.
2. to interview his/her reading and general music teacher to discover his/her strengths and weaknesses in reading at school.
3. to consult his/her school records and discover from achievement tests his school history of music and written language experiences.
4. to administer a reading test and analyse it to discover what processes he/she uses in reading.
5. to administer a music reading test of a similar type for the same reason.

The investigation should be a positive one for each child as well as myself in that we share an interest in finding the best way to help him/her learn to read music. The interviews would be conducted with this in mind.

The children will be anonymous in the recording of information and the writing of the findings. If, in the course of the study there are any questions which parents don't particularly care to answer, there is no requirement that they be answered. Although I cannot think of any questions which may be of this nature, this is being mentioned so that you know that at no time will you be coerced into any activity during the interviews or testing with which you do not agree.

If you, as parents, give your permission, I am also asking that you discuss it with your child and receive his assent as well since he/she is the center and essential part of the study. I would want him/her to understand that I am particularly interested in how he/she reads for the purpose of helping me to teach him/her better, and will be asking him/her questions and administering tests. If he/she prefers not to be part of this investigation, it is better that he/she be given the opportunity to refuse.

If you agree to be part of this study, would you please sign the permission form below and return it to me.

I give permission for my child ______________________________ to be part of a study of music and written language reading being undertaken by Patricia Brine in conjunction with a Masters degree program at the University of Alberta, Department of Elementary Education.

____

Signature

____

Address

______________ ______________

Phone Date